

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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	1		50
A. terreus 9A-1	KhsDCNSVDh	GYQCFPELSH	kWGLYAPYFS LQDESPFPID VPEDChITFV
A. terreus cbs	NhsDCTSVDr	GYQCFPELSH	kWGLYAPYFS LQDESPFPID VPDDChITFV
A. niger var. awamori	NqsTCDTVdQ	GYQCFSETSH	LWGQYAPFFS LANESAISPD VPAGCrVTFA
A. niger T213	NqsSCDTVDQ	GYQCFSETSH	LWGQYAPFFS LANESVISPD VPAGCrVTFA
A. niger NRRL3135	NqsSCDTVDQ	GYQCFSETSH	LWGQYAPFFS LANESVISPE VPAGCrVTFA
A. fumigatus 13073	GskSCDTVDl	GYQCsPATSH	LWGQYSPFFS LEDELSVSSK LPKDCrITLV
A. fumigatus 32722	GskSCDTVDl	GYQCsPATSH	LWGQYSPFFS LEDELSVSSK LPKDCrITLV
A. fumigatus 58128	GskSCDTVDl	GYQCsPATSH	LWGQYSPFFS LEDELSVSSK LPKDCrITLV
A. fumigatus 26906	GskSCDTVDl	GYQCsPATSH	LWGQYSPFFS LEDELSVSSK LPKDCrITLV
A. fumigatus 32239	GskACDTVEl	GYQCsPGTSH	LWGQYSPFFS LEDELSVSSD LPKDCrVTFV
E. nidulans	QNHSCNTADG	GYQCFPNVSH	VWGQYSPYFS IEQESAISd VPHGCEVTFV
T. thermophilus	DSHSCNTVEG	GYQCrPEISH	sWGQYSPFFS LADQSEISPD VPQNCkITFV
M. thermophila	ESRPCDTpDl	GFQCGTAISH	FWGQYSPYFS VpSElDaS.. IPDDCeVTFA
Consensus	NSHSCDTVDG	GYQCFPEISH	LWGQYSPYFS LEDESAISPD VPDDC-VTFV
Consensus phytase	NSHSCDTVDG	GYQCFPEISH	LWGQYSPYFS LEDESAISPD VPDDCrVTFV

	51		100
A. terreus 9A-1	QVLARHGARS	PTThSkKAYA	AtIAAIQKSA TaFpGKYAFL QSYNYSLDSE
A. terreus cbs	QVLARHGARS	PTDSKtKAYA	AtIAAIQKNA TaLpGKYAFL KSYNYSMGSE
A. niger var. awamori	QVLSRHGARY	PTESKgKkYS	ALIEEIQQNV TtFDGKYAFL KTYNYSLGAD
A. niger T213	QVLSRHGARY	PTESKgKkYS	ALIEEIQQNV TtFDGKYAFL KTYNYSLGAD
A. niger NRRL3135	QVLSRHGARY	PTDSKgKkYS	ALIEEIQQNA TtFDGKYAFL KTYNYSLGAD
A. fumigatus 13073	QVLSRHGARY	PTSSKsKkYK	kLVTAIQaNA TdFKGKFAFL KTYNYTLGAD
A. fumigatus 32722	QVLSRHGARY	PTSSKsKkYK	kLVTAIQaNA TdFKGKFAFL KTYNYTLGAD
A. fumigatus 58128	QVLSRHGARY	PTSSKsKkYK	kLVTAIQaNA TdFKGKFAFL KTYNYTLGAD
A. fumigatus 26906	QVLSRHGARY	PTSSKsKkYK	kLVTAIQaNA TdFKGKFAFL KTYNYTLGAD
A. fumigatus 32239	QVLSRHGARY	PTASKsKkYK	kLVTAIQKNA TeFKGKFAFL ETYNYTLGAD
E. nidulans	QVLSRHGARY	PTESKsKAYS	GLIEAIQKNA TsFwGQYAFI ESYNYTLGAD
T. thermophilus	QLLSRHGARY	PTSSKtElyS	QLISrIQKTA TaYKGyYAFI KDYrYqLGAN
M. thermophila	QVLSRHGARA	PTlKRaaSYV	DLIDrIHhGA IsYgPgYEFL RTYDYTLGAD
Consensus	QVLSRHGARY	PTSSK-KAYS	ALIEAIQKNA T-FKGKYAFL KTYNYTLGAD
Consensus phytase	QVLSRHGARY	PTSSKSKAYS	ALIEAIQKNA TAFKGKYAFL KTYNYTLGAD

	101		150
A. terreus 9A-1	ELTPFGrNQL	rDlGaQFYeR	YNALTRhInP FVRATDASRV hESAeKFVEG
A. terreus cbs	NLTPFGrNQL	qDlGaQFYRR	YDTLTRhInP FVRAADSSRV hESAeKFVEG
A. niger var. awamori	DLTPFGEQEL	VNSGIKFYQR	YESLTRNIIP FIRSSGSSRV IASGEKFIEG
A. niger T213	DLTPFGEQEL	VNSGIKFYQR	YESLTRNIIP FIRSSGSSRV IASGEKFIEG
A. niger NRRL3135	DLTPFGEQEL	VNSGIKFYQR	YESLTRNIVP FIRSSGSSRV IASGKKFIEG
A. fumigatus 13073	DLTPFGEQQL	VNSGIKFYQR	YKALARSVVP FIRASGSDRV IASGEKFIEG
A. fumigatus 32722	DLTPFGEQQL	VNSGIKFYQR	YKALARSVVP FIRASGSDRV IASGEKFIEG
A. fumigatus 58128	DLTPFGEQQL	VNSGIKFYQR	YKALARSVVP FIRASGSDRV IASGEKFIEG
A. fumigatus 26906	DLTAFGEQQL	VNSGIKFYQR	YKALARSVVP FIRASGSDRV IASGEKFIEG
A. fumigatus 32239	DLTPFGEQQM	VNSGIKFYQK	YKALAgSVVP FIRSSGSDRV IASGEKFIEG
E. nidulans	DLTiFGENQM	VDSGaKFYRR	YKNLARKnTP FIRASGSDRV VASAeKFIEG
T. thermophilus	DLTPFGENQM	IQLGIKFYnH	YKSLARNaVP FVRCSGSDRV IASGrIFIEG
M. thermophila	ELTRtGQQQM	VNSGIKFYRR	YRALARKsIP FVRTAGqDRV VhSAENFTQG
Consensus	DLTPFGENQM	VNSGIKFYRR	YKALARK-VP FVRASGSDRV IASAeKFIEG
Consensus phytase	DLTPFGENQM	VNSGIKFYRR	YKALARKIVP FIRASGSDRV IASAeKFIEG

Fig. 1a

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A. terreus 9A-1
A. terreus cbs
A. niger var. awamori
A. niger T213
A. niger NRRL3135
A. fumigatus 13073
A. fumigatus 32722
A. fumigatus 58128
A. fumigatus 26906
A. fumigatus 32239
E. nidulans
T. thermophilus
M. thermophila

Consensus
Consensus phytase

200

FQTARqDDHh ANpHQSPPrV DVaIPEGSAY NNTLEHS1CT AFES...STV
FQNAARqGDPh ANpHQSPPrV DVVIPEGTAY NNTLEHS1CT AFEA...STV
FQSTKLkDPr AqpQSSPKI DVVISEASSs NNTLDPGTCT VFED...SEL
FQSTKLkDPr AqpQSSPKI DVVISEASSs NNTLDPGTCT VFED...SEL
FQSTKLkDPr AqpQSSPKI DVVISEASSs NNTLDPGTCT VFED...SEL
FQqAKLADPG A.TNRAAPAI SVIIPSETF NNTLDHGVCT kFEA...SQL
FQqAKLADPG A.TNRAAPAI SVIIPSETF NNTLDHGVCT kFEA...SQL
FQqAKLADPG A.TNRAAPAI SVIIPSETF NNTLDHGVCT kFEA...SQL
FQqAKLADPG A.TNRAAPAI SVIIPSETF NNTLDHGVCT kFEA...SQL
FQqANVADPG A.TNRAAPVI SVIIPSETY NNTLDHSTCV NFEA...SEL
FRKAQLhDHG S..gQATPVV NVIIPeIDGF NNTLDHSTCV SFEN...DEX
FQSAKVldPh SDkHDAPPTI NVIIeEGPSY NNTLDtGSCP VFED...SSg
FHSALLADRG STvRPTlPyd mVVIPETAGa NNTLHND1CT AFEEgpySTI

FQSAKLADPG S-PHQASPVI NVIIPESGY NNTLDHGTCT AFED---SEL
FQSAKLADPG SQPHQASPVI DVIIPESGY NNTLDHGTCT AFED...SEL

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A. terreus 9A-1
A. terreus cbs
A. niger var. awamori
A. niger T213
A. niger NRRL3135
A. fumigatus 13073
A. fumigatus 32722
A. fumigatus 58128
A. fumigatus 26906
A. fumigatus 32239
E. nidulans
T. thermophilus
M. thermophila

Consensus
Consensus phytase

250

GDDAvANFTA VFAPAIaQRL EADLPGVqLS TDDVvnlMAM CPFETVS1TD
GDAADNFTA VFAPAIakRL EADLPGVqLS ADDVvnlMAM CPFETVS1TD
ADTVEANFTA TFAPSIRQRL ENDLsgVTLT DTEVtyLMDM CSFDTISTST
ADTVEANFTA TFAPSIRQRL ENDLsgVTLT DTEVtyLMDM CSFDTISTST
ADTVEANFTA TFVPSIRQRL ENDLsgVTLT DTEVtyLMDM CSFDTISTST
GDEVAANFTA lFAPDIRARA EkHLPgVTLT DEDVVsLMDM CSFDTVARTS
GDEVAANFTA lFAPDIRARA EkHLPgVTLT DEDVVsLMDM CSFDTVARTS
GDEVAANFTA lFAPDIRARA EkHLPgVTLT DEDVVsLMDM CSFDTVARTS
GDEVAANFTA lFAPDIRARA KkHLPgVTLT DEDVVsLMDM CSFDTVARTS
GDEVEANFTA lFAPAIRARI EkHLPgVqLT DDDVVsLMDM CSFDTMARTA
ADEiEANFTA IMGPPIRkRL ENDLPGIKLT NENViyLMDL CPFETLARNh
GHDAQEKfAk qFAPAIleKI KDHLPGVDLA vSDVpyLMDL CPFETVASS
GDDAQDtyLS TFAGPitARV NANLPGANLT DADTVaLMDL CPFETVASS

GDDAEANFTA TFAPAIRARL EADLPGVTLT DEDVV-LMDM CPFETVARTS
GDDVEANFTA lFAPAIRARL EADLPGVTLT DEDVVYLMDM CPFETVARTS

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A. terreus 9A-1
A. terreus cbs
A. niger var. awamori
A. niger T213
A. niger NRRL3135
A. fumigatus 13073
A. fumigatus 32722
A. fumigatus 58128
A. fumigatus 26906
A. fumigatus 32239
E. nidulans
T. thermophilus
M. thermophila

Consensus
Consensus phytase

300

..... DAhTLSPFC DLFTaEWtq YNYLlSLDKY YGYGGGNPLG
..... DAhTLSPFC DLFTaEWtq YNYLlSLDKY YGYGGGNPLG
..... vDTKLSPFC DLFTHdEWih YDYLQSLkKY YGHGAGNPLG
..... vDTKLSPFC DLFTHdEWih YDYLQSLkKY YGHGAGNPLG
..... vDTKLSPFC DLFTHdEWih YDYLQSLkKY YGHGAGNPLG
..... DASQLSPFC QLFTHnEWkk YNYLQSLGKY YGYGAGNPLG
..... DASQLSPFC QLFTHnEWkk YNYLQSLGKY YGYGAGNPLG
..... DASQLSPFC QLFTHnEWkk YNYLQSLGKY YGYGAGNPLG
..... DASQLSPFC QLFTHnEWkk YNYLQSLGKY YGYGAGNPLG
..... DASQLSPFC QLFTHnEWkk YNYLQSLGKY YGYGAGNPLG
..... DASELSPFC AIFTHnEWkk YDYLQSLGKY YGYGAGNPLG
..... HGTELSPPFC AIFTEkEWlq YDYLQSLGKY YGnGGGNPLG
..... TDT.LSPFC ALsTQeEWqa YDYLQSLGKY YGnGGGNPLG
sdpatadagg gNGrplSPFC rLFSEsEWra YDYLQSVGKW YGYGPNPLG

----- DATELSPPFC ALFTE-EW-- YDYLQSLGKY YGYGAGNPLG
..... DATELSPPFC ALFTHDEWRO YDYLQSLGKY YGYGAGNPLG

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	301		350
A. terreus 9A-1	PVQGVGWaNE	LMARLTRAPV	HDHTCVNNTL
A. terreus cbs	PVQGVGWaNE	LIARLTRSPV	HDHTCVNNTL
A. niger var. awamori	PTQGVGYaNE	LIARLTHSPV	HDDTSSNHTL
A. niger T213	PTQGVGYaNE	LIARLTHSPV	HDDTSSNHTL
A. niger NRRL3135	PTQGVGYaNE	LIARLTHSPV	HDDTSSNHTL
A. fumigatus 13073	PAQGIGFtNE	LIARLTRSPV	QDHTSTNsTL
A. fumigatus 32722	PAQGIGFtNE	LIARLTRSPV	QDHTSTNsTL
A. fumigatus 58128	PAQGIGFtNE	LIARLTRSPV	QDHTSTNsTL
A. fumigatus 26906	PAQGIGFtNE	LIARLTRSPV	QDHTSTNsTL
A. fumigatus 32239	PAQGIGFtNE	LIARLTNSPV	QDHTSTNsTL
E. nidulans	PAQGIGFtNE	LIARLTQSPV	QDNTSTNHTL
T. thermophilus	PAQGVGFvNE	LIARMTHSPV	QDYTTVNHTL
M. thermophila	PTQGVGFvNE	LLARLAgvPV	RDgTSTNRTL
Consensus	PAQGVGF-NE	LIARLTHSPV	QDHTSTNHTL
Consensus phytase	PAQGVGFANE	LIARLTRSPV	QDHTSTNHTL

	351		400
A. terreus 9A-1	SNLVSIFWAL	GLYNGTAPLS	qTSVESVSQT
A. terreus cbs	SNLVSIFWAL	GLYNGTkPLS	qTTVEDITrT
A. niger var. awamori	NGIISILFAL	GLYNGTkPLS	TTTVENITQT
A. niger T213	NGIISILFAL	GLYNGTkPLS	TTTVENITQT
A. niger NRRL3135	NGIISILFAL	GLYNGTkPLS	TTTVENITQT
A. fumigatus 13073	NSMVSIFFAL	GLYNGTEPLS	rTSVESaKEl
A. fumigatus 32722	NSMVSIFFAL	GLYNGTGPLS	rTSVESaKEl
A. fumigatus 58128	NSMVSIFFAL	GLYNGTEPLS	rTSVESaKEl
A. fumigatus 26906	NSMVSIFFAL	GLYNGTEPLS	rTSVESaKEl
A. fumigatus 32239	NGMIPIFFAM	GLYNGTEPLS	qTSeESTKES
E. nidulans	NSMISIFFAM	GLYNGTQPLS	mDSVESIQEm
T. thermophilus	NTMTSIFaAL	GLYNGTAKLS	TTEIKSIEET
M. thermophila	NDDMMGVLgAL	GayDGVPLD	KTArrDpEEl
Consensus	NSMISIFFAL	GLYNGTAPLS	TTSVESIEET
Consensus phytase	NSMISIFFAL	GLYNGTAPLS	TTSVESIEET

	401		450
A. terreus 9A-1	QC.....	.....RAEKE	PLVRVLVNDR
A. terreus cbs	QC.....	.....RAEKQ	PLVRVLVNDR
A. niger var. awamori	QC.....	.....QAEQE	PLVRVLVNDR
A. niger T213	QC.....	.....QAEQE	PLVRVLVNDR
A. niger NRRL3135	QC.....	.....QAEQE	PLVRVLVNDR
A. fumigatus 13073	QC.....	.....KSEKE	PLVRALINDR
A. fumigatus 32722	QC.....	.....KSEKE	PLVRALINDR
A. fumigatus 58128	QC.....	.....KSEKE	PLVRALINDR
A. fumigatus 26906	QC.....	.....KSEKE	PLVRALINDR
A. fumigatus 32239	QC.....	.....KSEKE	PLVRALINDR
E. nidulans	QC.....	.....E.KKE	PLVRVLVNDR
T. thermophilus	QC.....	.....DDSDE	PVVRVLVNDR
M. thermophila	RCsgggggggg	gggegrQEKDE	eMVRVLVNDR
Consensus	QC-----	-----QAEKE	PLVRVLVNDR
Consensus phytase	QC.....QAEKE	PLVRVLVNDR

Fig. 1c

APPROVED	O.G. FIG.	
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	451	471
A. terreus 9A-1	VAGLSFAQAG	GNWADCF~~~ -
A. terreus cbs	VEGLSFARAG	NWAECF~~~
A. niger var. awamori	VrGLSFARSG	GDWAECsA~~ -
A. niger T213	VrGLSFARSG	GDWAECFA~~ -
A. niger NRRL3135	VrGLSFARSG	DWAECFA~~
A. fumigatus 13073	VKGLSWARSG	GNWGECS~~ -
A. fumigatus 32722	VKGLSWARSG	GNWGECS~~ -
A. fumigatus 58128	VKGLSWARSG	GNWGECS~~ -
A. fumigatus 26906	VKGLSWARSG	GNWGECS~~ -
A. fumigatus 32239	VKGLSWARSG	NSEQSFS~~
E. nidulans	VEGLNFARSG	GNWkTCFTl~ -
T. thermophilus	VrGLSFARqG	GNWEGCYAas e
M. thermophila	IESMAFARGN	GKWDlCFA~~ -
Consensus	VEGLSFARSG	GNWAECFA-- -
Consensus phytase	VEGLSFARSG	GNWAECFA.. .

Fig. 1d

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CP-1

Eco RI M G V F V V L L S I A T L F G S T
TATATGAATTCATGGGCGTGTTCGTCGCTACTGTCCATTGCCACCTTGTTCGGTTCCA
1 -----+-----+-----+-----+-----+ 60
ATATACTTAAGTACCCGCACAAGCAGCAGCATGACAGGTAACGGTGAACAAGCCAAGGT

S G T A L G P R G N S H S C D T V D G G
CATCCGGTACCGCCTTGGGTCTCGTGTAATTCTCACTCTTGTGACACTGTTGACGGTG
61 -----+-----+-----+-----+-----+ 120
GTAGGCCATGGCGGAACCCAGGAGCACCATTAAAGAGTGAGAACACTGTGACAACCTGCCAC

CP-2

CP-3

Y Q C F P E I S H L W G Q Y S P Y F S L
GTTACCAATGTTTCCCAGAAATTCTCACTTGTGGGGTCAATACTCTCCATACTTCTCTT
121 -----+-----+-----+-----+-----+ 180
CAATGGTTACAAAGGGTCTTTAAAGAGTGAACACCCCAGTTATGAGAGGTATGAAGAGAA

E D E S A I S P D V P D D C R V T F V Q
TGGAAGACGAATCTGCTATTTCTCCAGACGTTCCAGACGACTGTAGAGTTACTTTCGTTT
181 -----+-----+-----+-----+-----+ 240
ACCTTCTGCTTAGACGATAAAGAGGTCTGCAAGGTCTGCTGACATCTCAATGAAAGCAAG

CP-4

CP-5

V L S R H G A R Y P T S S K S K A Y S A
AAGTTTTGTCTAGACACGGTGCTAGATACCCAATTCTTCTAAGTCTAAGGCTTACTCTG
241 -----+-----+-----+-----+-----+ 300
TTCAAAACAGATCTGTGCCACGATCTATGGGTTGAAGAAGATTGAGATTCCGAATGAGAC

L I E A I Q K N A T A F K G K Y A F L K
CTTTGATTGAAGCTATTCAAAGAACGCTACTGCTTTCAAGGGTAAGTACGCTTTCTTGA
301 -----+-----+-----+-----+-----+ 360
GAAACTAACTTCGATAAGTTTTCTTGGCATGACGAAAGTTCCCATTTCATGCGAAAGAACT

CP-6

CP-7

T Y N Y T L G A D D L T P F G E N Q M V
AGACTTACAACTACACTTTGGGTGCTGACGACTTGACTCCATTTCGGTGAAAACCAAATGG
361 -----+-----+-----+-----+-----+ 420
TCTGAATGTTGATGTGAAACCCACGACTGCTGAACTGAGGTAAGCCACTTTTGGTTTACC

N S G I K F Y R R Y K A L A R K I V P F
TTAACTCTGGTATTAAGTTCTACAGAAGATACAAGGCTTTGGCTAGAAAGATTGTTCCAT
421 -----+-----+-----+-----+-----+ 480
AATTGAGACCATAATTCAAGATGTCTTCTATGTTCCGAAACCGATCTTTCTAACAAGGTA

CP-8

CP-9

I R A S G S D R V I A S A E K F I E G F
TCATTAGAGCTTCTGGTTCTGACAGAGTTATTGCTTCTGCTGAAAAGTTTCATTGAAGGTT
481 -----+-----+-----+-----+-----+ 540
AGTAATCTCGAAGACCAAGACTGTCTCAATAACGAAGACGACTTTTCAAGTAACTTCCAA

Q S A K L A D P G S Q P H Q A S P V I D
TCCAATCTGCTAAGTTGGCTGACCCAGGTTCTCAACCACACCAAGCTTCTCCAGTTATTG
541 -----+-----+-----+-----+-----+ 600
AGGTTAGACGATTCAACCGACTGGGTCCAAGAGTTGGTGTGGTTCGAAGAGGTCAATAAC

Fig. 2a

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APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
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CP-10

CP-11

V I I P E G S G Y N N T L D H G T C T A
 ACGTTATTATTCCAGAAGGaTCCGGTTACAACAACACTTTGGACCACGGTACTTGTACTG
 601 -----+-----+-----+-----+-----+ 660
 TGCAATAATAAGGTCTTCCTAGgCCAATGTTGTTGTGAAACCTGGTGCCATGAACATGAC

F E D S E L G D D V E A N F T A L F A P
 CTTTCGAAGACTCTGAATTGGGTGACGACGTTGAAGCTAACTTCACTGCTTTGTTTCGCTC
 661 -----+-----+-----+-----+-----+ 720
 GAAAGCTTCTGAGACTTAACCCACTGCTGCAACTTCGATTGAAGTGACGAAACAAGCGAG
 CP-12

A I R A R L E A D L P G V T L T D E D V
 CAGCTATTAGAGCTAGATTGGAAGCTGACTTGCCAGGTGTTACTTTGACTGACGAAGACG
 721 -----+-----+-----+-----+-----+ 780
 GTCGATAATCTCGATCTAACCTTCGACTGAACGGTCCACAATGAAACTGACTGCTTCTGC

CP-13

V Y L M D M C P F E T V A R T S D A T E
 TTGTTTACTTGATGGACATGTGTCCATTTCGAAACTGTTGCTAGAACTTCTGACGCTACTG
 781 -----+-----+-----+-----+-----+ 840
 AACAAATGAACCTACCTGTACACAGGTAAGCTTTGACAACGATCTTGAAGACTGCGATGAC

L S P F C A L F T H D E W R Q Y D Y L Q
 AATTGTCTCCATTCTGTGCTTTGTTCACTCACGACGAATGGAGACAATACGACTACTTGC
 841 -----+-----+-----+-----+-----+ 900
 TTAACAGAGGTAAGACACGAAACAAGTGAGTGCTGCTTACCTCTGTTATGCTGATGAACG

CP-14

CP-15

S L G K Y Y G Y G A G N P L G P A Q G V
 AATCTTTGGGTAAGTACTACGGTTACGGTGCTGGTAACCCATTGGGTCCAGCTCAAGGTG
 901 -----+-----+-----+-----+-----+ 960
 TTAGAAACCCATTTCATGATGCCAATGCCACGACCATTGGGTAACCCAGGTGAGTTCCAC

G F A N E L I A R L T R S P V Q D H T S
 TTGGTTTCGCTAACGAATTGATTGCTAGATTGACTAGATCTCCAGTTCAAGACCACACTT
 961 -----+-----+-----+-----+-----+ 1020
 AACCAAAGCGATTGCTTAACTAACGATCTAACTGATCTAGAGGTCAAGTTCTGGTGTGAA

CP-16

CP-17

T N H T L D S N P A T F P L N A T L Y A
 CTACTAACCACACTTTGGACTCTAACCAGCTACTTTCCCATTGAACGCTACTTTGTACG
 1021 -----+-----+-----+-----+-----+ 1080
 GATGATTGGTGTGAAACCTGAGATTGGGTGATGAAAGGGTAACTTGCGATGAAACATGC

D F S H D N S M I S I F F A L G L Y N G
 CTGACTTCTCTCACGACAACTCTATGATTTCTATTTCTTCGCTTTGGGTTTGTACAACG
 1081 -----+-----+-----+-----+-----+ 1140
 GACTGAAGAGAGTGCTGTTGAGATACTAAAGATAAAAGAAGCGAAACCCAAACATGTTGC

CP-18

CP-19

T A P L S T T S V E S I E E T D G Y S A
 GTACTGCTCCATTGTCTACTACTTCTGTTGAATCTATTGAAGAACTGACGGTTACTCTG
 1141 -----+-----+-----+-----+-----+ 1200
 CATGACGAGGTAACAGATGATGAAGACAACCTTAGATAAATTCTTTGACTGCCAATGAGAC

Fig. 2b

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APPROVED	O.G. FIG.	
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S W T V P F G A R A Y V E M M Q C Q A E
 CTTCTTGACTGTTCCATTGCGGTGCTAGAGCTTACGTTGAAATGATGCAATGTCAAGCTG
 1201 -----+-----+-----+-----+-----+ 1260
 GAAGAACCTGACAAGGTAAGCCACGATCTCGAATGCAACTTTACTACGTTACAGTTGCGAC
 CP-20

K E P L V R V L V N D R V V P L H G C A
 AAAAGGAACCATTTGGTTAGAGTTTTGGTTAACGACAGAGTTGTTCCATTGCACGGTTGTG
 1261 -----+-----+-----+-----+-----+ 1320
 TTTTCCTTGGTAACCAATCTCAAAACCAATTGCTGTCTCAACAAGGTAACGTGCCAACAC

V D K L G R C K R D D F V E G L S F A R
 CTGTTGACAAGTTGGGTAGATGTAAGAGAGACGACTTCGTTGAAGGTTTGTCTTTCGCTA
 1321 -----+-----+-----+-----+-----+ 1380
 GACAACTGTTCAACCCATCTACATTCTCTCTGCTGAAGCAACTTCCAAACAGAAAGCGAT
 CP-22

S G G N W A E C F A * Eco RI
 GATCTGGTGGTAACTGGGCTGAATGTTTCGCTTAAGAATTCATATA
 1381 -----+-----+-----+-----+----- 1426
 CTAGACCACCATGACCCGACTTACAAAGCGAATTCTTAAGTATAT

Fig. 2c

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APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
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	1				50
<i>P. involutus</i> (phyA1)	SvP.KnTAPT	FPIPeseQrn	WSPYSPYFPL	AeYkAPPAGC	QInQVNIIQR
<i>P. involutus</i> (phyA2)	SvP.RniAPK	FSIPeseQrn	WSPYSPYFPL	AeYkAPPAGC	EInQVNIIQR
<i>T. pubescens</i>	hiPlRdTSAC	LdVTrDvQqs	WsmYSPYFpa	AtYvAPPASC	QInQVHIIQR
<i>A. pediades</i>	GgvvQaTfvQ	pfFPpQiQds	WAAYTPYYPV	qaYtPPPkDC	KItQVNIIQR
<i>P. lycii</i>	StQfsfvAAQ	LPIPaQntsn	WGPYdPFFPV	EpYaAPPEGC	tVtQVNLIQR

Basidio **S-P-R-TAAQ** **LPIP-Q-Q--** **WSPYSPYFPV** **A-Y-APPAGC** **QI-QVNIIQR**

	51				100
<i>P. involutus</i> (phyA1)	HGARFPTSGA	TTRIKAGLTK	LQGvqnftDA	KFNFIkSfky	dLGnsDLVPF
<i>P. involutus</i> (phyA2)	HGARFPTSGA	ATRIKAGLSK	LQSvqnftDP	KFDfIkSfTY	dLGtsDLVPF
<i>T. pubescens</i>	HGARFPTSGA	AkRIQTAVAK	LKAAsnyTDP	lLAFVtNyTY	sLGqDsLveL
<i>A. pediades</i>	HGARFPTSGA	GTRIQAaVvk	LQSAktyTDP	RLDfLtnyTY	tLGhDDLVPF
<i>P. lycii</i>	HGARWPTSGA	rSRqvAAVAK	IQmArpfTDP	KYEFLnDfvY	kFGvADLLPF

Basidio **HGARFPTSGA** **ATRIQAaVAK** **LQSA---TDP** **KLDfL-N-TY** **-LG-DDLVPF**

	101				150
<i>P. involutus</i> (phyA1)	GAaQSfDAGQ	EAFARYSkLV	SkNNLPFIRA	dGSDRVVDSA	TNWTAGFAsA
<i>P. involutus</i> (phyA2)	GAaQSfDAGl	EvFARYSkLV	SsDNLPFIRS	dGSDRVVDTA	TNWTAGFAsA
<i>T. pubescens</i>	GATQSSSEAGQ	EAFTRYSSLV	SaDELPPFVRA	SGSDRVVATA	nNWTAGFAlA
<i>A. pediades</i>	GAlQSSQAGE	ETFqRYSfLV	SkENLPFVRA	SSSNRVVDSA	TNWTegFSaA
<i>P. lycii</i>	GANQShQTGt	DmYTRYStLf	egGDVPFVRA	AGdQRVVDSS	TNWTAGFGdA

Basidio **GA-QSSQAGQ** **EAFTRYs-LV** **S-DNLPPFVRA** **SGSDRVVDSA** **TNWTAGFA-A**

	151				200
<i>P. involutus</i> (phyA1)	ShNTvqPkLn	LILPQtGNDT	LEDNMCPaAG	DSDPQvNaWL	AVafPSITAR
<i>P. involutus</i> (phyA2)	SrNAiqPkLd	LILPQtGNDT	LEDNMCPaAG	ESDPQvDaWL	AsafPSVTAQ
<i>T. pubescens</i>	SsNSitPvLs	VIISEaGNDT	LDDNMCPaAG	DSDPQvNqWL	AqFAPPMTAR
<i>A. pediades</i>	ShHvlnPiLf	VILSEslNDT	LDDaMCPnAG	sSDPQtGiWt	SIYGTPIAnR
<i>P. lycii</i>	SgETvlPtLq	VVLqEeGNct	LcNNMCPnEv	DGDest.tWL	GVFAPnITAR

Basidio **S-NT--P-L-** **VILSE-GNDT** **LDDNMCP-AG** **DSDPQ-N-WL** **AVFAPPITAR**

	201				250
<i>P. involutus</i> (phyA1)	LNAAAPSvNL	TDtDafNLvs	LCAf1TVSke	kkSdFctLFE	giPGsFeAFa
<i>P. involutus</i> (phyA2)	LNAAAPGANL	TDaDafNLvs	LCPFmTVSke	qkSdFctLFE	giPGsFeAFa
<i>T. pubescens</i>	LNAGAPGANL	TDtDTyNLlt	LCPFETVatE	rrSeFCDIYE	elQAE.dAFa
<i>A. pediades</i>	LNqqAPGANI	TAAdvsNLip	LCAFETivke	tpSpFCNLf.	.tPEEFaqFe
<i>P. lycii</i>	LNAAAPSANL	SDsDA1tLmd	MCPFDTLsG	naSpFCDLf.	.tAEEYvSYe

Basidio **LNAAAPGANL** **TD-DA-NL--** **LCPFETVS-E** **--S-FCDLFE** **--PEEF-AF-**

Fig. 3a

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APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
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251 300

P. involutus (phyA1) YgGDLDFKFG TGYGQeLGPV QGVGYVNELI ARLTnsAVRD NTQTNRTLDA

P. involutus (phyA2) YaGDLDFKFG TGYGQALGPV QGVGYINELL ARLTnsAVnD NTQTNRTLDA

T. pubescens YnADLDFKFG TGYGQPLGPV QGVGYINELI ARLTaQnVsD HTQTNsTLDS

A. pediades YfGDLDFKFG TGYGQPLGPV QGVGYINELL ARLTemPVRD NTQTNRTLDS

P. lycii YyyDLDFKYYG TGpGNALGPV QGVGYVNELL ARLTgQAVRD ETQTNRTLDS

Basidio Y-GDLDFKFG TGYGQPLGPV QGVGYINELL ARLT-QAVRD NTQTNRTLDS

301 350

P. involutus (phyA1) SPvTFPLNKT FYADFSHDNl MVAVFSAMGL FrQPAPLsTS vPNPwRTWRT

P. involutus (phyA2) APdTFPLNKT MYADFSHDNl MVAVFSAMGL FrQSAPLsTS tPDPNRTWLT

T. pubescens SPeTFPLNRT LYADFSHDNQ MVAIFSAMGL FNQSAPLDPT tPDParTFLv

A. pediades SPtTFPLDRS IYADLSHDNQ MIAIFSAMGL FNQSSPLDPS fPNPKRTWVT

P. lycii dPaTFPLNRT FYADFSHDNt MVPIFAALGL FNaTA.LDPl kPDeNRLWVd

Basidio SP-TFPLNRT FYADFSHDNQ MVAIFSAMGL FNQSAPLDPS -PDPNRTWVT

351 400

P. involutus (phyA1) SsLVPFSGRM VVERLsC..f GT..... tkV RVLVQDqVQP

P. involutus (phyA2) SsVVPFSARM aVERLsC..a GT..... tkV RVLVQDqVQP

T. pubescens kKIVPFsARM VVERLdC..g GA..... qsV RLLVNDVAVQP

A. pediades SRLtPFsARM VtERLlCqrd GTgsgggsri mrngnvqtfv RILVNDAVQP

P. lycii SKLVPFSGHM tVEKLaC... ..sgkeaV RVLVNDVAVQP

Basidio SKLVPFSARM VVERL-C--- GT----- -V RVLVNDVAVQP

401 441

P. involutus (phyA1) LEFCGGDrNG lCTLakFVES QtFARsDGaG DFEKCFATSa ~

P. involutus (phyA2) LEFCGGDqDG lCALDkFVES QaYARsGGaG DFEKCLATTV ~

T. pubescens LAFCGADtsG vCTLDAFVES QaYARNDGEG DFEKCFAT~~ ~

A. pediades LKFCGGDmDS lCTLEAFVES QkYAREDGQG DFEKCFD~~~ ~

P. lycii LEFCGG.vDG vCeLsAFVES QtYARENGQG DfAKCgfvPs e

Basidio LEFCGGD-DG -CTLDAFVES Q-YAREDGQG DFEKCFATP- -

Fig. 3b

00210" 5238460

Fig. 4a

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	151		200
A. terreus 9a1	GFQTARqDDh	hAnphQSPPr	VDVaIPEGsA YNNTLEHSLC TAFes...St
A. terreus cbs	GFQNARqGDP	hAnphQSPPr	VDVVIPEGtA YNNTLEHSIC TAFEa...St
A. niger var. awamori	GFQSTKLkDP	rAqpgQSSPk	IDVVISeAs sNNTLDpGtC TvFed...SE
A. niger NRRL3135	GFQSTKLkDP	rAqpgQSSPk	IDVVISeAs sNNTLDpGtC TvFed...SE
A. fumigatus 13073	GFQqAKLADP	gAt.nRAAPa	ISVIIPeSeT FNNTLDHGVC TkFEa...SQ
A. fumigatus 32722	GFQqAKLADP	gAt.nRAAPa	ISVIIPeSeT FNNTLDHGVC TkFEa...SQ
A. fumigatus 58128	GFQqAKLADP	gAt.nRAAPa	ISVIIPeSeT FNNTLDHGVC TkFEa...SQ
A. fumigatus 26906	GFQqAKLADP	gAt.nRAAPa	ISVIIPeSeT FNNTLDHGVC TkFEa...SQ
A. fumigatus 32239	GFQqANVADP	gAt.nRAAPV	ISVIIPeSeT YNNTLDHSVC TnFEa...SE
E. nidulans	GFRkaQLhDh	g.s.gQATPV	VNVIIPeIdG FNNTLDHStC vSFEn...dE
T. thermophilus	GFQSAKVLDp	hSdKhDAPpt	INVIIEEGps YNNTLDtGsC PvFed...Ss
T. lanuginosus	GFQdAKdrDP	rSnkdQAePV	INVIIEEtG sNNTLDgltC PAaEe...Ap
M. thermophila	GFHSALLADR	gStvrPTlPy	dmVVIPEtAG aNNTLHNDLC TAFEegPySt
Basidio	GFaxA.....	..sxntxxPx	LxVILSExg. .NDTLDDNMC .....PxAG
	Consensus	GFQSAKLADP -A---QASPV	INVIIPEG-G YNNTLDHGLC TAFE--P-SE
	Fcp10	GFQSAKLADP GANPHQASPV	INVIIPEGAG YNNTLDHGLC TAFEE...SE
	201		250
A. terreus 9a1	VGDDAvANFT	AVFAPAIaQR	LEAdLPGVQL StDDVVLMA MCPFETVSlT
A. terreus cbs	VGDAaADNFT	AVFAPAIaKR	LEAdLPGVQL SADDVVLMA MCPFETVSlT
A. niger var. awamori	LADtVEANFT	AtFAPSIRqR	LEndLSGvtL TDtEVtyLMD MCSFDTIstS
A. niger NRRL3135	LADtVEANFT	AtFvPSIRqR	LEndLSGvtL TDtEVtyLMD MCSFDTIstS
A. fumigatus 13073	LGDEVAANFT	ALFAPdIRAR	aEkhlPGVtL TDEDVVSIMD MCSFDTVArT
A. fumigatus 32722	LGDEVAANFT	ALFAPdIRAR	aEkhlPGVtL TDEDVVSIMD MCSFDTVArT
A. fumigatus 58128	LGDEVAANFT	ALFAPdIRAR	aEkhlPGVtL TDEDVVSIMD MCSFDTVArT
A. fumigatus 26906	LGDEVAANFT	ALFAPdIRAR	aEkhlPGVtL TDEDVVSIMD MCSFDTVArT
A. fumigatus 32239	LGDEVEANFT	ALFAPAIRAR	IEkhLPGVQL TDDDVSIMD MCSFDTVArT
E. nidulans	rADEIEANFT	AIMGPPIRkR	LEndLPGIKL TNENViYlMD MCSFDTMArT
T. thermophilus	gGHDAQEKFA	kqFAPAILEK	IKDhLPGVDL AvsDVpyLMD LCPFETLArN
T. lanuginosus	.DptqpAEFl	qVFGPRVlKk	ItkhMPGVNL TLEDVplFMD LCPFDTVGsd
M. thermophila	IGDDaQDtYl	StFAGPITAR	VNAnLPGaNL TDADtVaLMD LCPFETVAss
Basidio	dSDpqqnxWl	AVFAPPITAR	LNAaaPGaNL TDxDaxNLxx LCPFETVS..
	Consensus	LGDDVEANFT	AVFAPPIRAR LEA-LPGVNL TDEDVVLMD MCPFDTVArT
	Fcp10	LGDDVEANFT	AVFAPPIRAR LEAHLPGVNL TDEDVVLMD MCPFDTVArT
	251		300
A. terreus 9a1	dD..Aht...	.....LSPF	CDLFta..te WtQYNYLlSL dKYYGYGGGN
A. terreus cbs	dD..Aht...	.....LSPF	CDLFta..ae WtQYNYLlSL dKYYGYGGGN
A. niger var. awamori	Tv..DTK...	.....LSPF	CDLFTH..de WiHYDYlQSL kKYYGHGAGN
A. niger NRRL3135	Tv..DTK...	.....LSPF	CDLFTH..de WiNYDYlQSL kKYYGHGAGN
A. fumigatus 13073	SD..ASQ...	.....LSPF	CQLFTH..ne WkKYNyLQSL gKYYGYGAGN
A. fumigatus 32722	SD..ASQ...	.....LSPF	CQLFTH..ne WkKYNyLQSL gKYYGYGAGN
A. fumigatus 58128	SD..ASQ...	.....LSPF	CQLFTH..ne WkKYNyLQSL gKYYGYGAGN
A. fumigatus 26906	SD..ASQ...	.....LSPF	CQLFTH..ne WkKYNyLQSL gKYYGYGAGN
A. fumigatus 32239	AD..ASE...	.....LSPF	CAIFTH..ne WkKYDYlQSL gKYYGYGAGN
E. nidulans	AH..GTE...	.....LSPF	CAIFTE..ke WlQYDYlQSL sKYYGYGAGS
T. thermophilus	ht..DT....	.....LSPF	CALStQ..eE WqaYDYyQSL gKYYGnGGGN
T. lanuginosus	PvlfPrQ...	.....LSPF	CHLFta..dD WmaYDYyYTL dKYYSHGGGS
M. thermophila	SsdpaTadag	ggngRpLSPF	CrLFSE..se WraYDYlQSV gKWYGYGPGN
Basidio	.....	...xexxSxF	CDLFexxpeE FxaFxYxgdL dKFYGTgYGO
	Consensus	SD--ATQ---	-----LSPF CDLFTH---E W-QYDYlQSL -KYYGYGAGN
	Fcp10	SD..ATQ...LSPF CDLFTH..DE WiQYDYlQSL gKYYGYGAGN

Fig. 4b

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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	301		350
<i>A. terreus</i> 9a1	PLGPPvQGVGW	aNELMARLTR	A.PVHDHTCv NNTLDASPAT FPLNATLYAD
<i>A. terreus</i> cbs	PLGPPvQGVGW	aNELIARLTR	S.PVHDHTCv NNTLDANPAT FPLNATLYAD
<i>A. niger</i> var. <i>awamori</i>	PLGPTQGVGY	aNELIARLTH	S.PVHDDTSS NHTLDSNPAT FPLNSTLYAD
<i>A. niger</i> NRRL3135	PLGPTQGVGY	aNELIARLTH	S.PVHDDTSS NHTLDSSPAT FPLNSTLYAD
<i>A. fumigatus</i> 13073	PLGPAQGIGF	tNELIARLTR	S.PVQDHTST NsTLvSNPAT FPLNATMYvD
<i>A. fumigatus</i> 32722	PLGPAQGIGF	tNELIARLTR	S.PVQDHTST NsTLvSNPAT FPLNATMYvD
<i>A. fumigatus</i> 58128	PLGPAQGIGF	tNELIARLTR	S.PVQDHTST NsTLvSNPAT FPLNATMYvD
<i>A. fumigatus</i> 26906	PLGPAQGIGF	tNELIARLTR	S.PVQDHTST NsTLvSNPAT FPLNATMYvD
<i>A. fumigatus</i> 32239	PLGPAQGIGF	tNELIARLTN	S.PVQDHTST NsTLvSNPAT FPLNATMYvD
<i>E. nidulans</i>	PLGPAQGIGF	tNELIARLTQ	S.PVQDHTST NsTLvSNPAT FPLNATMYvD
<i>T. thermophilus</i>	PLGPAQGVGF	vNELIARMTg	S.PVQDHTST NHTLDSNPAT FPLNATLYAD
<i>T. lanuginosus</i>	AFGPSRGVGF	vNELIARMTg	NlPVKDHTTv NHTLDdNPET FPLDvLYAD
<i>M. thermophila</i>	PLGPTQGVGF	vNELLARLA	GvPVRDgTST NRTLdGDPRT FPLGrPLYAD
Basidio	PLGPPvQGVGY	iNELLARLTx	qa.VRDNTqT NRTLdSSPxT FPLNrtTFYAD

Consensus	PLGPAQGVGF	-NELIARLTH	S-PVQDHTST	NHTLDSNPAT	FPLNATLYAD
Fcp10	PLGPAQGVGF	VNELIARLTH	S.PVQDHTST	NHTLDSNPAT	FPLNATLYAD

	351		400
<i>A. terreus</i> 9a1	FSHDSnLVSI	FWALGLYNGT	aPLSqtSVE. .SvsQTDGYA AAWTVPFPAAR
<i>A. terreus</i> cbs	FSHDSnLVSI	FWALGLYNGT	kPLSqtTVE. .ditrTDGYA AAWTVPFPAAR
<i>A. niger</i> var. <i>awamori</i>	FSHDNGIISI	LFALGLYNGT	kPLSTTTVE. .NitQTDGFS SAWTVPFASR
<i>A. niger</i> NRRL3135	FSHDNGIISI	LFALGLYNGT	kPLSTTTVE. .NitQTDGFS SAWTVPFASR
<i>A. fumigatus</i> 13073	FSHDNSMVISI	FFALGLYNGT	ePLSrTSVE. .SaKElDGYS ASWvVPFGAR
<i>A. fumigatus</i> 32722	FSHDNSMVISI	FFALGLYNGT	gPLSrTSVE. .SaKElDGYS ASWvVPFGAR
<i>A. fumigatus</i> 58128	FSHDNSMVISI	FFALGLYNGT	ePLSrTSVE. .SaKElDGYS ASWvVPFGAR
<i>A. fumigatus</i> 26906	FSHDNSMVISI	FFALGLYNGT	ePLSrTSVE. .SaKElDGYS ASWvVPFGAR
<i>A. fumigatus</i> 32239	FSHDNGMPI	FFAMGLYNGT	ePLSqtSeE. .StKESNGYS ASWAVPFGAR
<i>E. nidulans</i>	FSHDNSMISI	FFAMGLYNGT	qPLSmdSVE. .SiQEmDGYA ASWTVPFGAR
<i>T. thermophilus</i>	FSHDNTMtSI	FaALGLYNGT	akLSTTeIK. .SiEETDGYS AAWTVPFGR
<i>T. lanuginosus</i>	FSHDNTMtGI	FsAMGLYNGT	kPLSTSkIQP pTgAAADGYA ASWTVPFPAAR
<i>M. thermophila</i>	FSHDNDMMGV	LgALGaYDgV	pPLdkTA..R rdpEElGGYA ASWAVPFAAR
Basidio	FSHDNQMVAI	FsAMGLFNqS	aPLdPSxpDP nrt.....Wv TSklVPFSAR

Consensus	FSHDNTMVISI	FFALGLYNGT	-PLSTTSVEP	-S-EETDGYS	ASWTVPFPAAR
Fcp10	FSHDNTMVISI	FFALGLYNGT	KPLSTTSVE.	.SiEETDGYS	ASWTVPFPAAR

	401		450
<i>A. terreus</i> 9a1	AYVEMMQC..	ra.....	.....EKEPL VRVLVNDVRM PLHGCPtDKL
<i>A. terreus</i> cbs	AYIEMMQC..	ra.....	.....EKQPL VRVLVNDVRM PLHGCAVDNL
<i>A. niger</i> var. <i>awamori</i>	lyVEMMQC..	Qa.....	.....EQEPL VRVLVNDRVV PLHGCPIDaL
<i>A. niger</i> NRRL3135	lyVEMMQC..	Qa.....	.....EQEPL VRVLVNDRVV PLHGCPVDaL
<i>A. fumigatus</i> 13073	AYfEtMQC..	Ks.....	.....EKEPL VRaLINDRVV PLHGCDVDKL
<i>A. fumigatus</i> 32722	AYfEtMQC..	Ks.....	.....EKEPL VRaLINDRVV PLHGCDVDKL
<i>A. fumigatus</i> 58128	AYfEtMQC..	Ks.....	.....EKESL VRaLINDRVV PLHGCDVDKL
<i>A. fumigatus</i> 26906	AYfEtMQC..	Ks.....	.....EKEPL VRaLINDRVV PLHGCDVDKL
<i>A. fumigatus</i> 32239	AYfEtMQC..	Ks.....	.....EKEPL VRaLINDRVV PLHGCAVDKL
<i>E. nidulans</i>	AYfELMQC..	E.....	.....KKEPL VRVLVNDRVV PLHGCAVDKF
<i>T. thermophilus</i>	AYIEMMQC..	Dd.....	.....sDEPV VRVLVNDRVV PLHGCEVDsL
<i>T. lanuginosus</i>	AYVELLRC..	Etetsseeee	EG...EDEPF VRVLVNDRVV PLHGCrVDRM
<i>M. thermophila</i>	iyVEkMRC..	sgggggggggg	EGrqeKDeEm VRVLVNDVRM TLkGCCaDer
Basidio	mvVERLxCxx	xgtxxxxxxxx	xxxxxxxxxxxx VRVLVNDaVq PLEfCGgDxd

Consensus	AYVEMMQC--	E-----	EG---EKEPL	VRVLVNDRVV	PLHGCGVDKL
Fcp10	AYVEMMQC..	EA.....EKEPL	VRVLVNDRVV	PLHGCGVDKL

Fig. 4c

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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	451	482
<i>A. terreus</i> 9a1	GRCKrDAFVA GLSFAQAG..	GNWADCF~~~
<i>A. terreus</i> cbs	GRCKrDDFVE GLSFARAG..	GNWAECE~~~~
<i>A. niger</i> var. <i>awamori</i>	GRCtrDsFvR GLSFARSG..	GDWAECsA~~~
<i>A. niger</i> NRRL3135	GRCtrDsFvR GLSFARSG..	GDWAECFA~~~
<i>A. fumigatus</i> 13073	GRCKlNDFVK GLSWARSG..	GNWGECSF~~~~
<i>A. fumigatus</i> 32722	GRCKlNDFVK GLSWARSG..	GNWGECSF~~~~
<i>A. fumigatus</i> 58128	GRCKlNDFVK GLSWARSG..	GNWGECSF~~~~
<i>A. fumigatus</i> 26906	GRCKlNDFVK GLSWARSG..	GNWGECSF~~~~
<i>A. fumigatus</i> 32239	GRCKlKDFVK GLSWARSG..	GNSEQSFS~~~~
<i>E. nidulans</i>	GRCtlDDWVE GLNFARSG..	GNWktCFTl~
<i>T. thermophilus</i>	GRCKrDDFvR GLSFARqG..	GNWEGCYAas e~
<i>T. lanuginosus</i>	GRCRrDEWIK GLTFARqG..	GHWDrCF~~~~
<i>M. thermophila</i>	GmCtlErFIE SMAFARGN..	GKWDlCFA~~~
Basidio	GxCtlDAFVE SqxYAReDgq	GDFEKCFAtp xx
Consensus	GRCK-DDFVE GLSFARSG--	GNWEECFa--
Fcp10	GRCKRDDFVE GLSFARSG..	GNWEECFa..

Fig. 4d

CP-1
Eco RI M G V F V V L L S I A T L F G S T 17
TATATGAATTCATGGGCGTGTTCGTCGTGCTACTGTCCATTGCCACCTTGTTCGGTTCCA
1 -----+-----+-----+-----+-----+-----+ 60
ATATACTTAAGTACCCGCACAAGCAGCACGATGACAGGTAACGGTGAACAAGCCAAGGT

S G T A L G P R G N S H S C D T V D G G 37
CATCCGGTACCGCCTTGGGTCTCTCGTGGTAATTCTCACTCTTGTGACACTGTTGACGGTG
61 -----+-----+-----+-----+-----+-----+ 120
GTAGGCCATGGCGGAACCCAGGAGCACCATTAAGAGTGAGAACACTGTGACAACCTGCCAC
CP-2
CP-3.10
Y Q C F P E I S H L W G Q Y S P F F S L 57
GTTACCAATGTTTCCCAGAAATTTCTCACTTGTGGGGTCAATACTCTCCATTCTTCTCTT
121 -----+-----+-----+-----+-----+-----+ 180
CAATGGTTACAAAGGGTCTTTAAAGAGTGAACACCCAGTTATGAGAGGTAAGAAGAGAA

A D E S A I S P D V P K G C R V T F V Q 77
TGGCTGACGAATCTGCTATTTCTCCAGACGTTCCAAAGGGTGTAGAGTTACTTTCGTTT
181 -----+-----+-----+-----+-----+-----+ 240
ACCGACTGCTTAGACGATAAAAGAGGTCTGCAAGGTTTCCCGACATCTCAATGAAAGCAAG
CP-4.10
CP-5.10
V L S R H G A R Y P T S S K S K K Y S A 97
AAGTTTTGTCTAGACACGGTGCTAGATACCCAACCTTCTTCTAAGTCTAAGAAGTACTCTG
241 -----+-----+-----+-----+-----+-----+ 300
TTCAAAACAGATCTGTGCCACGATCTATGGGTTGAAGAAGATTCAGATTCTTCATGAGAC

L I E A I Q K N A T A F K G K Y A F L K 117
CTTTGATTGAAGCTATTCAAAAGAACGCTACTGCTTTCAAGGGTAAGTACGCTTTCTTGA
301 -----+-----+-----+-----+-----+-----+ 360
GAAACTAATTTCGATAAGTTTTCTTGCATGACGAAAGTTCCCATTCATGCGAAAGAAGT
CP-6
CP-7.10
T Y N Y T L G A D D L T P F G E Q Q M V 137
AGACTTACAATACTACTTTGGGTGCTGACGACTTGACTCCATTTCGGTGAACAACAATGG
361 -----+-----+-----+-----+-----+-----+ 420
TCTGAATGTTGATGTGAAACCCACGACTGCTGAAGTGAAGGTAAGCCACTTGTGTTTACC

N S G I K F Y R R Y K A L A R K I V P F 157
TTAACTCTGGTATTAAGTTCTACAGAAGATACAAGGCTTTGGCTAGAAAGATTGTTCCAT
421 -----+-----+-----+-----+-----+-----+ 480
AATTGAGACCATAATTCAAGATGTCTTCTATGTTCCGAAACCGATCTTTCTAACAAGGTA
CP-8.10
CP-9.10
V R A S G S D R V I A S A E K F I E G F 177
TCGTTAGAGCTTCTGGTTCTGACAGAGTTATTGCTTCTGCTGAAAAGTTCAATGAAGGTT
481 -----+-----+-----+-----+-----+-----+ 540
AGCAATCTCGAAGACCAAGACTGTCTCAATAACGAAGACGACTTTTCAAGTAAGTTCCAA

Q S A K L A D P G A N P H Q A S P V I N 197
TCCAATCTGCTAAGTTGGCTGACCCAGGTGCTAACCCACACCAAGCTTCTCCAGTTATTA
541 -----+-----+-----+-----+-----+-----+ 600
AGGTTAGACGATTCAACCGACTGGGTCCACGATTGGGTGTGGTTTGAAGAGGTCAATAAT

Fig. 5a

000270" 59288460

[illegible]

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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S W T V P F A A R A Y V E M M Q C E A E 417
 CTTCTTGGACTGTTCCATTGCTGCTAGAGCTTACGTTGAAATGATGCAATGTGAAGCTG
 1201 -----+-----+-----+-----+-----+ 1260
 GAAGAACCTGACAAGGTAAGCCACGATCTCGAATGCAACTTTACTACGTTACACTTCGAC
 CP-20.10
 CP-21.10
 K E P L V R V L V N D R V V P L H G C G 437
 AAAAGGAACCATTGGTTAGAGTTTTGGTTAACGACAGAGTTGTTCCATTGCACGGTTGTG
 1261 -----+-----+-----+-----+-----+ 1320
 TTTTCCTTGGTAACCAATCTCAAACCAATTGCTGTCTCAACAAGGTAACGTGCCAACAC
 V D K L G R C K R D D F V E G L S F A R 457
 GTGTTGACAAGTTGGGTAGATGTAAGAGAGACGACTTCGTTGAAGGTTTGTCTTTTCGCTA
 1321 -----+-----+-----+-----+-----+ 1380
 CACAACCTGTTCAACCCATCTACATTCTCTCTGCTGAAGCAACTTCCAAACAGAAAGCGAT
 CP-22.10
 S G G N W E E C F A * Eco RI 467
 GATCTGGTGGTAACTGGGAAGAATGTTTCGCTTAAGAATTCATATA
 1381 -----+-----+-----+-----+----- 1426
 CTAGACCACCATTGACCCTTCTTACAAAGCGAATTCTTAAGTATAT

000210"59288460

Fig. 5c

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	1			50
<i>P. involutus</i> (phyA1)	~~~~~	-FPipeseqR	nWSPYSPYFP	LAeyKA.... pPaGCQInqV
<i>P. involutus</i> (phyA2)	~~~~~	-FsipeseqR	nWSPYSPYFP	LAeyKA.... pPaGCeInqV
<i>T. pubescens</i>	~~~~~	-LDvtRDVqQ	sWSmYSPYFP	aAtyvA.... pPaSCQInqV
<i>A. pediades</i>	~~~~~	-pffpPQIQD	sWAaYTPYYP	VqAyTP.... pPKDCKITqV
<i>P. lycii</i>	~~~~~	-LPipAQnTs	nWGPYdPFFP	VEpyAA.... pPEGCTVTqV
<i>A. terreus</i> 9a1	KhSDCNSVDh	GYQCfPELSH	kWGLYAPYFS	LqDESFPFlD VPEDCHITFV
<i>A. terreus</i> cbs	NhSDCtSVDr	GYQCfPELSH	kWGLYAPYFS	LqDESFPFlD VPDDCHITFV
<i>A. niger</i> var. <i>awamori</i>	NqSTCDTVDq	GYQCfSetSH	LWGQYAPFFS	LANESAISPD VPAGCRVTFa
<i>A. niger</i> T213	NqSSCDTVDq	GYQCfSetSH	LWGQYAPFFS	LANESvISPD VPAGCRVTFa
<i>A. niger</i> NRRL3135	NqSSCDTVDq	GYQCfSetSH	LWGQYAPFFS	LANESvISPE VPAGCRVTFa
<i>A. fumigatus</i> ATCC13073	GSKSCDTVDl	GYQCsPatSH	LWGQYSPFFS	LEDElSVSSK LPKDCRITLV
<i>A. fumigatus</i> ATCC32722	GSKSCDTVDl	GYQCsPatSH	LWGQYSPFFS	LEDElSVSSK LPKDCRITLV
<i>A. fumigatus</i> ATCC58128	GSKSCDTVDl	GYQCsPatSH	LWGQYSPFFS	LEDElSVSSK LPKDCRITLV
<i>A. fumigatus</i> ATCC26906	GSKSCDTVDl	GYQCsPatSH	LWGQYSPFFS	LEDElSVSSK LPKDCRITLV
<i>A. fumigatus</i> ATCC32239	GSKACDTVEl	GYQCsPgTSH	LWGQYSPFFS	LEDElSVSSD LPKDCRVTFV
<i>E. nidulans</i>	QNHSCNTaDg	GYQCfPNVSH	VWGQYSPYFS	IEQESAISD VPhGCeVTFV
<i>T. thermophilus</i>	DSHSCNTVEg	GYQCrPEISH	sWGQYSPFFS	LADQSEISPD VPQNCKITFV
<i>T. lanuginosus</i>	~~~~~	~~~~~nvDIAR	hWGQYSPFFS	LAEvSEISPA VPKGCRVeFV
<i>M. thermophila</i>	ESRPCDTpDl	GFQCgTAISH	FWGQYSPYFS	VPsElDaS.. IPDDCeVTFa

Consensus Seq. 11 NSHSCDTVD- GYQC-PEISH LWGQYSPFFS LADESAISPD VPKGCRVTFV

	51			100
<i>P. involutus</i> (phyA1)	NIIqRHGARF	PTSGaTtRik	AgLtKLQgvq	nftDAKFnFI KSFKYdLGns
<i>P. involutus</i> (phyA2)	NIIqRHGARF	PTSGaAtrik	AgLsKLQsvq	nftDPKFDFI KSFTYdLGts
<i>T. pubescens</i>	HIIqRHGARF	PTSGaAKRiq	TaVAKLKaaS	nytdPlLAFV tnYtYSLGqD
<i>A. pediades</i>	NIIqRHGARF	PTSGaGtRiq	AaVKKLQsak	TytdPRLDFL tnYtYTLGhD
<i>P. lycii</i>	NLIqRHGARW	PTSGarsRqv	AaVAKIQmar	PftDPKYEFL NdFvYkFGvA
<i>A. terreus</i> 9a1	QVLARHGARS	PThSKTKaYA	AtIAaIQKSA	TaFpGKYAFL QSYNYSLDSE
<i>A. terreus</i> cbs	QVLARHGARS	PTdSKTKaYA	AtIAaIQKNA	TaLpGKYAFL KSYNYSMGSE
<i>A. niger</i> var. <i>awamori</i>	QVLSRHGARY	PTeSKGKKYS	ALIEeIQQNv	TtFDGKYAFL KTYNYSLGAD
<i>A. niger</i> T213	QVLSRHGARY	PTeSKGKKYS	ALIEeIQQNv	TtFDGKYAFL KTYNYSLGAD
<i>A. niger</i> NRRL3135	QVLSRHGARY	PTdSKGKKYS	ALIEeIQQNA	TtFDGKYAFL KTYNYSLGAD
<i>A. fumigatus</i> ATCC13073	QVLSRHGARY	PTSSKSKKYk	kLVtaIQaNA	TdFKGKFAFL KTYNYTLGAD
<i>A. fumigatus</i> ATCC32722	QVLSRHGARY	PTSSKSKKYk	kLVtaIQaNA	TdFKGKFAFL KTYNYTLGAD
<i>A. fumigatus</i> ATCC58128	QVLSRHGARY	PTSSKSKKYk	kLVtaIQaNA	TdFKGKFAFL KTYNYTLGAD
<i>A. fumigatus</i> ATCC26906	QVLSRHGARY	PTSSKSKKYk	kLVtaIQaNA	TdFKGKFAFL KTYNYTLGAD
<i>A. fumigatus</i> ATCC32239	QVLSRHGARY	PTASKSKKYk	kLVtaIQKNA	TeFKGKFAFL ETYNYTLGAD
<i>E. nidulans</i>	QVLSRHGARY	PTeSKSKaYS	GLIEaIQKNA	TsFwGQYAFI ESYNYTLGAD
<i>T. thermophilus</i>	QLLSRHGARY	PTSSKTELYS	qLIsRIQKtA	TaYKGyYAFI KdYrYqLGAN
<i>T. lanuginosus</i>	QVLSRHGARY	PTAhKSEvYA	ELLQRIQDtA	TeFKGDFAFI RdYaYhLGAD
<i>M. thermophila</i>	QVLSRHGARA	PTlKRAasYv	DLIDRIHhGA	isYgPgYEFL RTYDYTLGAD

Consensus Seq. 11 QVLSRHGARY PTSSKSKKYs ALIERIQKNA T-FKGKYAFL KTYNYTLGAD

Fig. 6a

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	101		150
<i>P. involutus</i> (phyA1)	DLvPFGAaQs	fDAGqEaFaR	YskLvSKNnL PFIRAdGSDR VVDSAtNWtA
<i>P. involutus</i> (phyA2)	DLvPFGAaQs	fDAGLEvFaR	YskLvSsDnL PFIRsdGSDR VVDtAtNWtA
<i>T. pubescens</i>	sLveLGAtQs	sEAGqEaFtR	YsSLvSaDeL PFVRASGSDR VVATANNWtA
<i>A. pediades</i>	DLvPFGAlQs	sQAGeEtFQR	YsfLvSKEnL PFVRASSSNR VVDSAtNWtE
<i>P. lycii</i>	DLlPFGANQs	hQTGTDMYtR	YsTLfEgGdV PFVRAAGdQR VVDSStNWtA
<i>A. terreus</i> 9a1	ELTPFGrNQL	rDlGaQFYeR	YNAL.TRHIn PFVRATDasR VhESAeKFVE
<i>A. terreus</i> cbs	NLTPFGrNQL	qDlGaQFYRR	YDTL.TRHIn PFVRAADsSR VhESAeKFVE
<i>A. niger</i> var. <i>awamori</i>	DLTPFGEQEL	VNSGIKFYQR	YESL.TRNII PFIRSSGSsR VIASGEKFIE
<i>A. niger</i> T213	DLTPFGEQEL	VNSGIKFYQR	YESL.TRNII PFIRSSGSsR VIASGEKFIE
<i>A. niger</i> NRRL3135	DLTPFGEQEL	VNSGIKFYQR	YESL.TRNIV PFIRSSGSsR VIASGKKFIE
<i>A. fumigatus</i> ATCC13073	DLTPFGEQQL	VNSGIKFYQR	YKAL.ARSV V PFIRASGSDR VIASGEKFIE
<i>A. fumigatus</i> ATCC32722	DLTPFGEQQL	VNSGIKFYQR	YKAL.ARSV V PFIRASGSDR VIASGEKFIE
<i>A. fumigatus</i> ATCC58128	DLTPFGEQQL	VNSGIKFYQR	YKAL.ARSV V PFIRASGSDR VIASGEKFIE
<i>A. fumigatus</i> ATCC26906	DLTAFGEQQL	VNSGIKFYQR	YKAL.ARSV V PFIRASGSDR VIASGEKFIE
<i>A. fumigatus</i> ATCC32239	DLTPFGEQQL	VNSGIKFYQK	YKAL.AgSVV PFIRSSGSsR VIASGEKFIE
<i>E. nidulans</i>	DLTiFGENQM	VDsGaKFYRR	YKnL.ARKnt PFIRASGSDR VVASAEKFIn
<i>T. thermophilus</i>	DLTPFGENQM	IQlGIKFYnH	YKSL.ARNv PFVRCsGSDR VIASGrLFIE
<i>T. lanuginosus</i>	NLTRFGEEQM	MESGrQFYHR	YREq.AREIV PFVRAAGsAR VIASAEfFnr
<i>M. thermophila</i>	ELTRtGQQQM	VNSGIKFYRR	YRAL.ARKS I PFVRTAGdQR VVhSAENfTQ

Consensus Seq. 11

DLTPFGENQM VNSGIKFYRR YKAL-ARNIV PFVRASGSDR VIASAEKFIE

	151		200
<i>P. involutus</i> (phyA1)	GFaSA.....	..shNtvqPk	LNLILPQ..T gNDTLEDNMC PAAgD.....
<i>P. involutus</i> (phyA2)	GFaSA.....	..srNaiqPk	LDLILPQ..T gNDTLEDNMC PAAgE.....
<i>T. pubescens</i>	GFaLA.....	..ssNsITPV	LSVIISE..A gNDTLDDNMC PAAgD.....
<i>A. pediades</i>	GFsAA.....	..shHvlnPI	LfVILSE..S LNDTLDDAMC PnaGs.....
<i>P. lycii</i>	GFgda.....	..sgEtvlpT	LQVVLQE..E gNcTLcNNMC PnevD.....
<i>A. terreus</i> 9a1	GFQTARqDDh	hAnpHQPSPr	VDVaIPEGSA YNNTLEHSLC TAFES...ST
<i>A. terreus</i> cbs	GFQNARqGDP	hAnpHQPSPr	VDVVIPEGTA YNNTLEHSIC TAFEa...ST
<i>A. niger</i> var. <i>awamori</i>	GFQSTKLkDP	rAqpgQSSPk	IDVvISEASS sNNTLDpGtC TvFED...Se
<i>A. niger</i> T213	GFQSTKLkDP	rAqpgQSSPk	IDVvISEASS sNNTLDpGtC TvFED...Se
<i>A. niger</i> NRRL3135	GFQSTKLkDP	rAqpgQSSPk	IDVvISEASS sNNTLDpGtC TvFED...Se
<i>A. fumigatus</i> ATCC13073	GFQqAKLADP	gAt.NRAAPa	ISVIIPESeT FNNTLDHGVC TkFEa...Sq
<i>A. fumigatus</i> ATCC32722	GFQqAKLADP	gAt.NRAAPa	ISVIIPESeT FNNTLDHGVC TkFEa...Sq
<i>A. fumigatus</i> ATCC58128	GFQqAKLADP	gAt.NRAAPa	ISVIIPESeT FNNTLDHGVC TkFEa...Sq
<i>A. fumigatus</i> ATCC26906	GFQqAKLADP	gAt.NRAAPa	ISVIIPESeT FNNTLDHGVC TkFEa...Sq
<i>A. fumigatus</i> ATCC32239	GFQqANVADP	gAt.NRAAPV	ISVIIPESeT YNNTLDHSVC TnFEa...Se
<i>E. nidulans</i>	GFRkaQLhDh	g.s.gQATPV	VNVIIPeIdG FNNTLDHStC vSFEN...de
<i>T. thermophilus</i>	GFQSAKVLDp	hSdKHDAPpT	INVIIeEGPS YNNTLDtGsC PvFED...SS
<i>T. lanuginosus</i>	GFQdAKdrDP	rSnkDQAEpV	INVIISEETG sNNTLDgltC PAAEE...AP
<i>M. thermophila</i>	GFHSALLADR	gStvRPTlPy	dmVVIPEtAG aNNTLHNDLC TAFEEgpyST

Consensus Seq. 11

GFQSAKLADP -A--HQASPV INVIIPEGSG YNNTLDHGVC TAFED---ST

Fig. 6b

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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	201		250
<i>P. involutus</i> (phyA1)	.SDpqvnaWl	AVafPSItAR	LNAAApsvNL TdtDafNLVs LCAFlTVSK.
<i>P. involutus</i> (phyA2)	.SDpqvDaWl	AsafPSvtAQ	LNAAApgANL TDADafNLVs LCPFmTVSK.
<i>T. pubescens</i>	.SDpqvnQWl	AqFAPPMtAR	LNAgAPGaNL TdtDtyNLLt LCPFETVat.
<i>A. pediades</i>	.SDpqtGiWT	SIYGTPIanR	LNqqaPGaNI TAADVsnLIp LCAFETivK.
<i>P. lycii</i>	.GDESt.tWl	GVFAPnItAR	LNAAApsaNL SDsDaLtLMD MCPFDTLss.
<i>A. terreus</i> 9a1	VGDDAvANFT	AVFAPAIaQR	LEAdLPGVQL StDDVVNLMA MCPFETVSlT
<i>A. terreus</i> cbs	VGDAADNFT	AVFAPAIaKR	LEAdLPGVQL SADDVVNLMA MCPFETVSlT
<i>A. niger</i> var. <i>awamori</i>	LADtveANFT	AtFAPSIRqR	LEndLSGVtL TdtEVtyLMD MCSFDtISTs
<i>A. niger</i> T213	LADtveANFT	AtFAPSIRqR	LEndLSGVtL TdtEVtyLMD MCSFDtISTs
<i>A. niger</i> NRRL3135	LADtveANFT	AtFvPSIRqR	LEndLSGVtL TdtEVtyLMD MCSFDtISTs
<i>A. fumigatus</i> ATCC13073	LGDEvAANFT	ALFAPdIRAR	aEkhlPGVtL TDEDVVSIMD MCSFDTVART
<i>A. fumigatus</i> ATCC32722	LGDEvAANFT	ALFAPdIRAR	aEkhlPGVtL TDEDVVSIMD MCSFDTVART
<i>A. fumigatus</i> ATCC58128	LGDEvAANFT	ALFAPdIRAR	aEkhlPGVtL TDEDVVSIMD MCSFDTVART
<i>A. fumigatus</i> ATCC26906	LGDEvAANFT	ALFAPdIRAR	aKkhLPGVtL TDEDVVSIMD MCSFDTVART
<i>A. fumigatus</i> ATCC32239	LGDEvAANFT	ALFAPdIRAR	IEkhLPGVQL TDDDVVSIMD MCSFDTVART
<i>E. nidulans</i>	rADEiEANFT	AIMGPPIRkR	LEndLPGIKL TNENViYlMD MCSFDtMART
<i>T. thermophilus</i>	gGHDAQEKFA	kqFAPAIlEK	IKDhLPGVDL AvsDVpyLMD LCPFETLARN
<i>T. lanuginosus</i>	.DptqpAEFl	qVFGPRVlkK	ItkhMPGVNL TLEDVplFMD LCPFDTVGsd
<i>M. thermophila</i>	IGDDAQDtYl	StFAGPItAR	VNAnLPGaNL TDADtValMD LCPFETVAss

Consensus Seq. 11

LGDDAEANFT AVFAPPiRAR LEA-LPGVNL TDEDVVNLMD MCPFDTVART

	251		300
<i>P. involutus</i> (phyA1)	.....	.....ekksdF	CtLFegipGs FeaFAYggdL dKFYGTgYgQ
<i>P. involutus</i> (phyA2)	.....	.....eqksdF	CtLFegipGs FeaFAYagdL dKFYGTgYgQ
<i>T. pubescens</i>	.....	.....errSeF	CDIYeelqAE .daFAYnadL dKFYGTgYgQ
<i>A. pediades</i>	.....	.....etpSPF	CNLF..TPEE FaQFEYFgdL dKFYGTgYgQ
<i>P. lycii</i>	.....	.....gnaSPF	CDLF..TAAE YvsYEEYydL dKYYGTgPGN
<i>A. terreus</i> 9a1	dD..Aht...	.....LSPF	CDLF..TatE WtQYNYLlSL dKYYGYGGGN
<i>A. terreus</i> cbs	dD..Aht...	.....LSPF	CDLF..TAAE WtQYNYLlSL dKYYGYGGGN
<i>A. niger</i> var. <i>awamori</i>	Tv..DTK...	.....LSPF	CDLF..ThDE WiHYDYLQSL kKYYGHGAGN
<i>A. niger</i> T213	Tv..DTK...	.....LSPF	CDLF..ThDE WiHYDYLRS� kKYYGHGAGN
<i>A. niger</i> NRRL3135	Tv..DTK...	.....LSPF	CDLF..ThDE WiNYDYLQSL kKYYGHGAGN
<i>A. fumigatus</i> ATCC13073	SD..ASQ...	.....LSPF	CQLF..ThNE WkKYNYLQSL gKYYGYGAGN
<i>A. fumigatus</i> ATCC32722	SD..ASQ...	.....LSPF	CQLF..ThNE WkKYNYLQSL gKYYGYGAGN
<i>A. fumigatus</i> ATCC58128	SD..ASQ...	.....LSPF	CQLF..ThNE WkKYNYLQSL gKYYGYGAGN
<i>A. fumigatus</i> ATCC26906	SD..ASQ...	.....LSPF	CQLF..ThNE WkKYNYLQSL gKYYGYGAGN
<i>A. fumigatus</i> ATCC32239	AD..ASE...	.....LSPF	CAIF..ThNE WkKYDYLQSL gKYYGYGAGN
<i>E. nidulans</i>	AH..GTE...	.....LSPF	CAIF..TEKE WlQYDYLQSL sKYYGYGAGS
<i>T. thermophilus</i>	ht..DT....	.....LSPF	CALs..TqEE WqaYDYYQSL gKYYGnGGGN
<i>T. lanuginosus</i>	PvlfPrQ...	.....LSPF	CHLF..TADD WmaYDYYyTL dKYYSHGGGS
<i>M. thermophila</i>	SsdpATadag	ggngprLSPF	CrLF..SEsE WraYDYLQSV gKYYGYGPGN

Consensus Seq. 11

SD--ATQ--- -----LSPF CDLF--TADE W-QYDYLQSL -KYYGYGAGN

Fig. 6c

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P. involutus (phyA1) eLGPvQGVGY vNELIARLTN S.AVRDNTqT NRTLDAASPvT FPLNkTFYAD 350
P. involutus (phyA2) ALGPvQGVGY iNELLARLTN S.AVNDNTqT NRTLDAaPDT FPLNkTMYAD
T. pubescens PLGPvQGVGY iNELIARLTa q.nVsDHTqT NsTLdSSPET FPLNrTLYAD
A. pediades PLGPvQGVGY iNELLARLTm m.PVRDNTqT NRTLdSSPlT FPLDrSIYAD
P. lycii ALGPvQGVGY vNELLARLTg q.AVRDETqT NRTLdSDPAT FPLNrTFYAD
A. terreus 9a1 PLGPvQGVGW aNELMARLTR A.PVHDHTCv NNTLDASPAT FPLNATLYAD
A. terreus cbs PLGPvQGVGW aNELIARLTR S.PVHDHTCv NNTLDANPAT FPLNATLYAD
A. niger var. *awamori* PLGPTQGVGY aNELIARLTH S.PVHDDTSS NHTLDSNPAT FPLNSTLYAD
A. niger T213 PLGPTQGVGY aNELIARLTH S.PVHDDTSS NHTLDSNPAT FPLNSTLYAD
A. niger NRRL3135 PLGPTQGVGY aNELIARLTH S.PVHDDTSS NHTLdSSPAT FPLNSTLYAD
A. fumigatus ATCC13073 PLGPAQGIGF tNELIARLTR S.PVQDHTST NsTLvSNPAT FPLNATMYvD
A. fumigatus ATCC32722 PLGPAQGIGF tNELIARLTR S.PVQDHTST NsTLvSNPAT FPLNATMYvD
A. fumigatus ATCC58128 PLGPAQGIGF tNELIARLTR S.PVQDHTST NsTLvSNPAT FPLNATMYvD
A. fumigatus ATCC26906 PLGPAQGIGF tNELIARLTR S.PVQDHTST NsTLvSNPAT FPLNATMYvD
A. fumigatus ATCC32239 PLGPAQGIGF tNELIARLTN S.PVQDHTST NsTLdSDPAT FPLNATIYvD
E. nidulans PLGPAQGIGF tNELIARLTQ S.PVQDNTST NHTLDSNPAT FPLDrKLYAD
T. thermophilus PLGPAQGVGF vNELIARMTg S.PVQDYTTv NHTLDSNPAT FPLNATLYAD
T. lanuginosus AFGPSRGVGF vNELIARMTg NlPVKDHTTv NHTLDdNPET FPLDAvLYAD
M. thermophila PLGPTQGVGF vNELLARLA. GvPVRDgTST NRTLdGDPrT FPLGrPLYAD

Consensus Seq. 11

351

P. involutus (phyA1) FSHDNlMVAV FsAMGLFrqP aPLSTSVpNP wrt....Wr TSSLVPFSGR 400
P. involutus (phyA2) FSHDNlMVAV FsAMGLFrqS aPLSTSTpDP nrt....Wl TSSvVPFSAR
T. pubescens FSHDNqMVAI FsAMGLFNqS aPLdPTTpDP art....Fl vkkiVPFSAR
A. pediades LSHDNqMIAI FsAMGLFNqS sPLdPSfpNP krt....Wv TSRLtPFSAR
P. lycii FSHDNTMVPI FaALGLFNAT a.LdPlkpDe nrl....Wv DSKlVPFSGH
A. terreus 9a1 FSHDSnLVSI FWALGLYNGT aPLSqtSVES Vs..QTDGYA AAWTVPFAAR
A. terreus cbs FSHDSnLVSI FWALGLYNGT KPLSqtTTVED It..rTDGYA AAWTVPFAAR
A. niger var. *awamori* FSHDNGIISI LFALGLYNGT KPLSTTTVEN It..QTDGFS SAWTVPFASR
A. niger T213 FSHDNGIISI LFALGLYNGT KPLSTTTVEN It..QTDGFS SAWTVPFASR
A. niger NRRL3135 FSHDNGIISI LFALGLYNGT KPLSTTTVEN It..QTDGFS SAWTVPFASR
A. fumigatus ATCC13073 FSHDNSMVIS FFALGLYNGT EPLSrTSVES ak..ElDGYS ASWvVPFGAR
A. fumigatus ATCC32722 FSHDNSMVIS FFALGLYNGT gPLSrTSVES ak..ElDGYS ASWvVPFGAR
A. fumigatus ATCC58128 FSHDNSMVIS FFALGLYNGT EPLSrTSVES ak..ElDGYS ASWvVPFGAR
A. fumigatus ATCC26906 FSHDNSMVIS FFALGLYNGT EPLSrTSVES ak..ElDGYS ASWvVPFGAR
A. fumigatus ATCC32239 FSHDNGMIPI FFAMGLYNGT EPLSqtSeES tk..ESNGYS ASWAVPFGAR
E. nidulans FSHDNSMISI FFAMGLYNGT QPLSmdSVES Iq..EmDGYA ASWTVPFGAR
T. thermophilus FSHDNTMtSI FaALGLYNGT akLSTTeIKS Ie..ETDGYS AAWTVPFGGR
T. lanuginosus FSHDNTMtGI FsAMGLYNGT KPLSTSkIQP ptgaAADGYA ASWTVPFAAR
M. thermophila FSHDNDMMGV LgALGaYDgv pPLdkTArrd ..peElGGYA ASWAVPFAAR

Consensus Seq. 11

FSHDNTMVSI FFALGLYNGT KPLSTTSVES I---ETDGYA ASWTVPFAAR

Fig. 6d

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	401		450
<i>P. involutus</i> (phyA1)	mvVERLsC.. fGt.....	Tk VRVLVQDQVq	PLEfCGgDRn
<i>P. involutus</i> (phyA2)	maVERLsC.. AGt.....	Tk VRVLVQDQVq	PLEfCGgDQd
<i>T. pubescens</i>	mvVERLDC.. GGa.....	Qs VRLLVNDaVq	PLafCGaDts
<i>A. pediades</i>	mvTErLlCQr DGtGsGGpsr	imrNgnvQTF VRILVNDaLq	PLkfCGgDmd
<i>P. lycii</i>	mtVEkLaC.. ..sgKea	VRVLVNDaVq	PLEfCGg.vd
<i>A. terreus</i> 9a1	AYVEMMQCrA ..EK...EPL	VRVLVNDRVm	PLHGCPtDKL
<i>A. terreus</i> cbs	AYIEMMQCrA ..EK...QPL	VRVLVNDRVm	PLHGCAVDNL
<i>A. niger</i> var. awamori	lyVEMMQCQA ..EQ...EPL	VRVLVNDRVV	PLHGCPIDaL
<i>A. niger</i> T213	lyVEMMQCQA ..EQ...EPL	VRVLVNDRVV	PLHGCPIDaL
<i>A. niger</i> NRRL3135	lyVEMMQCQA ..EQ...EPL	VRVLVNDRVV	PLHGCPVDaL
<i>A. fumigatus</i> ATCC13073	AYfEtMQCKs ..EK...EPL	VRaLINDRVV	PLHGCDVDKL
<i>A. fumigatus</i> ATCC32722	AYfEtMQCKs ..EK...EPL	VRaLINDRVV	PLHGCDVDKL
<i>A. fumigatus</i> ATCC58128	AYfEtMQCKs ..EK...ESL	VRaLINDRVV	PLHGCDVDKL
<i>A. fumigatus</i> ATCC26906	AYfEtMQCKs ..EK...EPL	VRaLINDRVV	PLHGCDVDKL
<i>A. fumigatus</i> ATCC32239	AYfEtMQCKs ..EK...EPL	VRaLINDRVV	PLHGCAVDKL
<i>E. nidulans</i>	AYfELMQCE. ....KK...EPL	VRVLVNDRVV	PLHGCAVDKF
<i>T. thermophilus</i>	AYIEMMQCDD ..sD...EPV	VRVLVNDRVV	PLHGCEVDsL
<i>T. lanuginosus</i>	AYVELLRcET ETsSeEEeEG	..ED...EPF	VRVLVNDRVV
<i>M. thermophila</i>	iYVEkMRCsG GGgGgGGgEG	..rQekdEem	VRVLVNDRVm
			TLkGCGaDER
			PLHGCGVDKL

Consensus Seq. 11

AYVEMMQCEA GG-G-GG-EG --EK---EPL VRVLVNDRVV PLHGCGVDKL

	451		482
<i>P. involutus</i> (phyA1)	GlCtLAKFVE SqTFARSDga	GDFEKCFAts	a~
<i>P. involutus</i> (phyA2)	GlCaLDKFVE SqAYARSGga	GDFEKCLAtt	v~
<i>T. pubescens</i>	GvCtLDaFVE SqAYARNDge	GDFEKCFAt~	~~
<i>A. pediades</i>	SlCtLEAFVE SqkYAReDgq	GDFEKCFD~	~~
<i>P. lycii</i>	GvCELSaFVE SqTYARENgq	GDFAKCgfv	se
<i>A. terreus</i> 9a1	GRCKrDAFVA GLSFAQAG..	GNWADCF~	~~
<i>A. terreus</i> cbs	GRCKrDDFVE GLSFARAG..	GNWAECF~	~~
<i>A. niger</i> var. awamori	GRCtrDsFVr GLSFARSG..	GDWAECsA~	~~
<i>A. niger</i> T213	GRCtrDsFVr GLSFARSG..	GDWAECFA~	~~
<i>A. niger</i> NRRL3135	GRCtrDsFVr GLSFARSG..	GDWAECFA~	~~
<i>A. fumigatus</i> ATCC13073	GRCKLNDfVK GLSWARSG..	GNWGECSF~	~~
<i>A. fumigatus</i> ATCC32722	GRCKLNDfVK GLSWARSG..	GNWGECSF~	~~
<i>A. fumigatus</i> ATCC58128	GRCKLNDfVK GLSWARSG..	GNWGECSF~	~~
<i>A. fumigatus</i> ATCC26906	GRCKLNDfVK GLSWARSG..	GNWGECSF~	~~
<i>A. fumigatus</i> ATCC32239	GRCKLNDfVK GLSWARSG..	GNSEQSFs~	~~
<i>E. nidulans</i>	GRCTLDDWVE GLNFARSG..	GNWktCFT1~	~~
<i>T. thermophilus</i>	GRCKrDDFVr GLSFARqG..	GNWEGCYAas	e~
<i>T. lanuginosus</i>	GRCrRDEWIK GLTFARqG..	GHWDrcF~	~~
<i>M. thermophila</i>	GmCtLErFIE SMAFARGN..	GKWDlCFA~	~~

Consensus Seq. 11

GRCKLDDFVE GLSFARSG-- GNWAECFA-- --

Fig. 6e

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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M G V F V V L L S I A T L F G S T S G T 20
 ATGGGCGTGTTTCGTGCTACTGTCCATTGCCACCTTGTTCCGGTTCACATCCGGTACC
 1 -----+-----+-----+-----+-----+ 60
 TACCCGCACAAGCAGCAGCATGACAGGTAACGGTGAACAAGCCAAGGTGTAGGCCATGG

 A L G P R G N S H S C D T V D G G Y Q C 40
 GCCTTGGGTCCTCGTGGTAATTCTCACTCTTGTGACACTGTTGACGGTGGTTACCAATGT
 61 -----+-----+-----+-----+-----+ 120
 CGGAACCCAGGAGCACCATTAAAGAGTGAGAACACTGTGACAACTGCCACCAATGGTTACA

 F P E I S H L W G T Y S P Y F S L A D E 60
 TTCCAGAAATTTCTCACTTGTGGGTACCTACTCTCCATACTTCTCTTTGGCAGACGAA
 121 -----+-----+-----+-----+-----+ 180
 AAGGGTCTTTAAAGAGTGAACACCCCATGGATGAGAGGTATGAAGAGAAACCGTCTGCTT

 S A I S P D V P D D C R V T F V Q V L S 80
 TCTGCTATTTCTCCAGACGTTCCAGACGACTGTAGAGTTACTTTTCGTTCAAGTTTTGTCT
 187 -----+-----+-----+-----+-----+ 240
 AGACGATAAAGAGGTCTGCAAGGTCTGCTGACATCTCAATGAAAGCAAGTTCAAAACAGA

 R H G A R Y P T S S A S K A Y S A L I E 100
 AGACACGGTGCTAGATACCCAACTTCTTCTGCGTCTAAGGCTTACTCTGCTTTGATTGAA
 241 -----+-----+-----+-----+-----+ 300
 TCTGTGCCACGATCTATGGGTTGAAGAAGACGCAGATTCCGAATGAGACGAACTAACTT

 A I Q K N A T A F K G K Y A F L K T Y N 120
 GCTATTCAAAAGAACGCTACTGCTTTCAAGGGTAAGTACGCTTTCTTGAAGACTTACAAC
 301 -----+-----+-----+-----+-----+ 360
 CGATAAGTTTCTTTCGATGACGAAAGTTCCCATTCATGCGAAAGAACTTCTGAATGTTG

 Y T L G A D D L T P F G E N Q M V N S G 140
 TACACTTTGGGTGCTGACGACTTGACTCCATTCCGGTGAAAACCAAATGGTTAACTCTGGT
 361 -----+-----+-----+-----+-----+ 420
 ATGTGAAACCCACGACTGCTGAACTGAGGTAAGCCACTTTTGGTTTACCAATTGAGACCA

 I K F Y R R Y K A L A R K I V P F I R A 160
 ATTAAGTTCTACAGAAGATAACAAGGCTTTGGCTAGAAAGATTGTTCCATTCTAGAGCT
 421 -----+-----+-----+-----+-----+ 480
 TAATTCAAGATGTCTTCTATGTTCCGAAACCGATCTTTCTAACAAGGTAAGTAATCTCGA

 S G S D R V I A S A E K F I E G F Q S A 180
 TCTGGTCTGACAGAGTTATTGCTTCTGCTGAAAAGTTTCAAGGTTTCCAATCTGCT
 481 -----+-----+-----+-----+-----+ 540
 AGACCAAGACTGTCTCAATAACGAAGACGACTTTTCAAGTAACTTCCAAAGGTTAGACGA

 K L A D P G S Q P H Q A S P V I N V I I 200
 AAGTTGGCTGACCCAGGTTCTCAACCACACCAAGCTTCTCCAGTTATTAACGTGATCATT
 541 -----+-----+-----+-----+-----+ 600
 TTCAACCGACTGGGTCCAAGAGTTGGTGTGGTTCGAAGAGGTCAATAATTGCACTAGTAA

 P E G S G Y N N T L D H G T C T A F E D 220
 CCAGAAGGATCCGGTTACAACAACACTTTGGACCACGGTACTTGTACTGCTTTTGAAGAC
 601 -----+-----+-----+-----+-----+ 660
 GGTCTTCTAGGCCAATGTTGTTGTGAAACCTGGTGGCATGAACATGACGAAAGCTTCTG

Fig. 7a

000210" 59288460

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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S E L G D D V E A N F T A L F A P A I R 240
 TCTGAATTAGGTGACGACGTTGAAGCTAACTTCACTGCTTTGTTTCGCTCCAGCTATTAGA
 661 -----+-----+-----+-----+-----+ 720
 AGACTTAATCCACTGCTGCAACTTCGATTGAAGTGACGAAACAAGCGAGGTCGATAATCT

 A R L E A D L P G V T L T D E D V V Y L 260
 GCTAGATTGGAAGCTGACTTGCCAGGTGTTACTTTGACTGACGAAGACGTTGTTTACTTG
 721 -----+-----+-----+-----+-----+ 780
 CGATCTAACCTTCGACTGAACGGTCCACAATGAACTGACTGCTTCTGCAACAAATGAAC

 M D M C P F D T V A R T S D A T E L S P 280
 ATGGACATGTGTCCATTTCGACACTGTGCTAGAACTTCTGACGCTACTGAATTGTCTCCA
 781 -----+-----+-----+-----+-----+ 840
 TACCTGTACACAGGTAAGCTGTGACAGCGATCTTGAAGACTGCGATGACTTAACAGAGGT

 F C A L F T H D E W I Q Y D Y L Q S L G 300
 TTCTGTGCTTTGTTCACTCACGACGAATGGATCCAATACGACTACTTGCAAAGCTTGGGT
 841 -----+-----+-----+-----+-----+ 900
 AAGACACGAAACAAGTGAGTGCTGCTTACCTAGGTTATGCTGATGAACGTTTCGAACCCA

 K Y Y G Y G A G N P L G P A Q G V G F A 320
 AAGTACTACGGTTACGGTGCTGGTAACCCATTGGGTCCAGCTCAAGGTGTTGGTTTCGCT
 901 -----+-----+-----+-----+-----+ 960
 TTCATGATGCCAATGCCACGACCATTGGGTAACCCAGGTGAGTTCCACAACCAAAGCGA

 N E L I A R L T H S P V Q D H T S T N H 340
 AACGAATTGATTGCTAGATTGACTCACTCTCCAGTTCAAGACCACACTTCTACTAACCAC
 961 -----+-----+-----+-----+-----+ 1020
 TTGCTTAACCTAACGATCTAACTGAGTGAGAGGTCAAGTTCTGGTGTAAGATGATTGGTG

 T L D S N P A T F P L N A T L Y A D F S 360
 ACTTTGGACTCTAACCAGCTACTTTCCATTGAACGCTACTTTGTACGCTGACTTCTCT
 1021 -----+-----+-----+-----+-----+ 1080
 TGAAACCTGAGATTGGGTGCTGATGAAAGGGTAACCTTGCGATGAAACATGCGACTGAAGAGA

 H D N T M I S I F F A L G L Y N G T K P 380
 CACGACAACACTATGATATCTATTTTCTTCGCTTTGGGTTTGTACAACGGTACCAAGCCA
 1081 -----+-----+-----+-----+-----+ 1140
 GTGCTGTTGTGATACTATAGATAAAAGAAGCGAAACCCAAACATGTTGCCATGGTTCGGT

 L S T T S V E S I E E T D G Y S A S W T 400
 TTGTCTACTACTTCTGTTGAATCTATTGAAGAACTGACGGTTACTCTGCTTCTTGACT
 1141 -----+-----+-----+-----+-----+ 1200
 AACAGATGATGAAGACAACCTTAGATAACTTCTTTGACTGCCAATGAGACGAAGAACCTGA

 V P F A A R A Y V E M M Q C Q A E K E P 420
 GTTCCATTGCTGCTAGAGCTTACGTTGAAATGATGCAATGTCAAGCTGAAAAGGAACCA
 1201 -----+-----+-----+-----+-----+ 1260
 CAAGGTAAGCGACGATCTCGAATGCAACTTTACTACGTTACAGTTCGACTTTTCCTTGGT

 L V R V L V N D R V V P L H G C A V D K 440
 TTGGTTAGAGTTTGGTTAACGACAGAGTTGTTCCATTGCACGGTTGTGCTGTTGACAAG
 1261 -----+-----+-----+-----+-----+ 1320
 AACCAATCTCAAAACCAATTGCTGTCTCAACAAGGTAACGTGCCAACACGACAACCTGTT

000270"5928265"02000

Fig. 7b

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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L G R C K R D D F V E G L S F A R S G G      460
TTGGGTAGATGTAAGAGAGACGACTTCGTTGAAGGTTTGTCTTTTCGCTAGATCTGGTGGT
1321 -----+-----+-----+-----+-----+-----+-----+ 1380
AACCCATCTACATTCTCTCTGCTGAAGCAACTTCCAAACAGAAAGCGATCTAGACCACCA

N W A E C F A *      467
AACTGGGCTGAATGTTTCGCTTAA
1381 -----+-----+----- 1410
TTGACCCGACTTACAAAGCGAATT

```

[illegible]

Fig. 7c

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

26/56

S E L G D D V E A N F T A V F A P P I R 240
 TCTGAATTGGGTGACGACGTTGAAGCTAACTTCACTGCTGTTTTCGCTCCACCAATTAGA
 661 -----+-----+-----+-----+-----+ 720
 AGACTTAACCCACTGCTGCAACTTCGATTGAAGTGACGACAAAAGCGAGGTGGTTAATCT

 A R L E A H L P G V N L T D E D V V N L 260
 GCTAGATTGGAAGCTCACTTGCCAGGTGTTAACTTGACTGACGAAGACGTTGTAACTTG
 721 -----+-----+-----+-----+-----+ 780
 CGATCTAACCTTCGAGTGAACGGTCCACAATTGAACTGACTGCTTCTGCAACAATTGAAC

 M D M C P F D T V A R T S D A T Q L S P 280
 ATGGACATGTGTCCATTGACACTGTTGCTAGAACTTCTGACGCTACTCAATTGTCTCCA
 781 -----+-----+-----+-----+-----+ 840
 TACCTGTACACAGGTAAGCTGTGACAACGATCTTGAAGACTGCGATGAGTTAACAGAGGT

 F C D L F T H D E W I Q Y D Y L Q S L G 300
 TTCTGTGACTTGTTCACCTCACGACGAATGGATTCAATACGACTACTTGCAATCTTTGGGT
 841 -----+-----+-----+-----+-----+ 900
 AAGACACTGAACAAGTGAGTGCTTGCTTACCTAAGTTATGCTGATGAACGTTAGAAACCCA

 K Y Y G Y G A G N P L G P A Q G V G F V 320
 AAGTACTACGGTTACGGTGCTGGTAACCCATTGGGTCCAGCTCAAGGTGTTGGTTTCGTT
 901 -----+-----+-----+-----+-----+ 960
 TTCATGATGCCAATGCCACGACCATTTGGGTAACCCAGGTCGAGTTCCACAACCAAAGCAA

 N E L I A R L T H S P V Q D H T S T N H 340
 AACGAATTGATTGCTAGATTGACTCACTCTCCAGTTCAAGACCACACTTCTACTAACCAC
 961 -----+-----+-----+-----+-----+ 1020
 TTGCTTAACTAACGATCTAACTGAGTGAGAGGTCAAGTTCTGGTGTGAAGATGATTGGTG

 T L D S N P A T F P L N A T L Y A D F S 360
 ACTTTGGACTCTAACCCAGCTACTTTCCCATTTGAACGCTACTTTGTACGCTGACTTCTCT
 1021 -----+-----+-----+-----+-----+ 1080
 TGAAACCTGAGATTGGGTGATGAAAGGGTAACCTTGCGATGAAACATGCGACTGAAGAGA

 H D N T M V S I F F A L G L Y N G T K P 380
 CACGACAACACTATGGTTTCTATTTTCTTCGCTTTGGGTTTGTACAACGGTACTAAGCCA
 1081 -----+-----+-----+-----+-----+ 1140
 GTGCTGTTGTGATACCAAAGATAAAAGAAGCGAAACCCAAACATGTTGCCATGATTCCGGT

 L S T T S V E S I E E T D G Y S A S W T 400
 TTGTCTACTACTTCTGTTGAATCTATTGAAGAACTGACGGTTACTCTGCTTCTTGGACT
 1141 -----+-----+-----+-----+-----+ 1200
 AACAGATGATGAAGACAACCTTAGATAACTTCTTTGACTGCCAATGAGACGAAGAACCTGA

 V P F A A R A Y V E M M Q C E A E K E P 420
 GTTCCATTGCTGCTAGAGCTTACGTTGAAATGATGCAATGTGAAGCTGAAAAGGAACCA
 1201 -----+-----+-----+-----+-----+ 1260
 CAAGGTAAGCGACGATCTCGAATGCAACTTTACTACGTTACACTTCGACTTTTCCTTGGT

 L V R V L V N D R V V P L H G C G V D K 440
 TTGGTTAGAGTTTTGGTTAACGACAGAGTTGTTCCATTGCACGGTTGTGGTGTGACAAG
 1261 -----+-----+-----+-----+-----+ 1320
 AACCAATCTCAAACCAATTGCTGTCTCAACAAGGTAACGTGCCAACACCACAACCTGTTT

00020" 3328460

Fig. 8b

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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L G R C K R D D F V E G L S F A R S G G      460
TTGGGTAGATGTAAGAGAGACGACTTCGTTGAAGGTTTGTCTTTCGCTAGATCTGGTGGT
1321 -----+-----+-----+-----+-----+ 1380
AACCCATCTACATTCTCTCTGCTGAAGCAACTTCCAAACAGAAAGCGATCTAGACCACCA

N W E E C F A *      467
AACTGGGAAGAATGTTTCGCTTAA
1381 -----+-----+----- 1404
TTGACCCTTCTTACAAAGCGAATT

```

Fig. 8c

09438265 012000

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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M G V F V V L L S I A T L F G S T S G T 20
 ATGGGGGTTTTTCGTCGTTCTATTATCTATCGCGACTCTGTTTCGGCAGCACATCGGGCACT
 1 -----+-----+-----+-----+-----+-----+ 60
 TACCCCCAAAAGCAGCAAGATAATAGATAGCGCTGAGACAAGCCGTCGTGTAGCCCGTGA

 A L G P R G N H S K S C D T V D L G Y Q 40
 GCGCTGGGCCCCCGTGGAATCACTCCAAGTCTGCGATACGGTAGACCTAGGGTACCAG
 61 -----+-----+-----+-----+-----+-----+ 120
 CGCGACCCGGGGGCACCTTTAGTGAGGTTTCAGGACGCTATGCCATCTGGATCCCATGGTC

 C S P A T S H L W G T Y S P Y F S L E D 60
 TGCTCCCTGCGACTTCTCATCTATGGGGCACGTACTCGCCATaCTTTTCGCTCGAGGAC
 121 -----+-----+-----+-----+-----+-----+ 180
 ACGAGGGGACGCTGAAGAGTAGATACCCCGtgCATGAGCGGTatGAAAAGCGAGCTCCTG

 E L S V S S K L P K D C R I T L V Q V L 80
 GAGCTGTCCGTGTCGAGTAAGCTTCCCAAGGATTGCCGGATCACCTTGGTACAGGTGCTA
 181 -----+-----+-----+-----+-----+-----+ 240
 CTCGACAGGCACAGCTCATTCGAAGGGTTCCTAACGGCCTAGTGGAACCATGTCCACGAT

 S R H G A R Y P T S S K S K K Y K K L I 100
 TCGCGCCATGGAGCGCGGTACCCAACCAGCTCCAAGAGCAAAAAGTATAAGAAGCTTaTt
 241 -----+-----+-----+-----+-----+-----+ 300
 AGCGCGGTACCTCGCGCCATGGGTTGGTCGAGGTTCTCGTTTTTCATATTCTTCGAAtAa

 T A I Q A N A T D F K G K Y A F L K T Y 120
 ACGGCGATCCAGGCCAATGCCACCGACTTCAAGGGCAAGTAcGCCTTTTTGAAGACGTAC
 301 -----+-----+-----+-----+-----+-----+ 360
 TGCCGCTAGGTCCGGTTACGGTGGCTGAAGTTCCCGTTCaTgCGGAAAAACTTCTGCATG

 N Y T L G A D D L T P F G E Q Q L V N S 140
 AACTATACTCTGGGTGCGGATGACCTCACTCCCTTTGGGGAGCAGCAGCTGGTGAACTCG
 361 -----+-----+-----+-----+-----+-----+ 420
 TTGATATGAGACCCACGCCTACTGGAGTGAGGGAAACCCCTCGTCGTCGACCACTTGAGC

 G I K F Y Q R Y K A L A R S V V P F I R 160
 GGCATCAAGTTCTACCAGAGGTACAAGGCTCTGGCGCGCAGTGTTGGTGGCGTTTATTTCGC
 421 -----+-----+-----+-----+-----+-----+ 480
 CCGTAGTTCAAGATGGTCTCCATGTTCCGAGACCGCGGTCACACCACGGCAAATAAGCG

 A S G S D R V I A S G E K F I E G F Q Q 180
 GCCTCAGGCTCGGACCGGGTTATTGCTTCGGGAGAGAAGTTCATCGAGGGGTTCAGCAG
 481 -----+-----+-----+-----+-----+-----+ 540
 CGGAGTCCGAGCCTGGCCCAATAACGAAGCCCTCTCTTCAAGTAGCTCCCCAAGGTCGTC

 A K L A D P G A T N R A A P A I S V I I 200
 GCGAAGCTGGCTGATCCTGGCGCGACGAACCGCGCCGCTCCGGCGATTAGTGTGATTATT
 541 -----+-----+-----+-----+-----+-----+ 600
 CGCTTCGACCGACTAGGACCGCGCTGCTTGGCGCGGCGAGGCCGCTAATCACACTAATAA

 P E S E T F N N T L D H G V C T K F E A 220
 CCGGAGAGCGAGACGTTCAACAATACGCTGGACCACGGTGTGTGCACGAAGTTTGAGGCG
 601 -----+-----+-----+-----+-----+-----+ 660
 GGCCTCTCGCTCTGCAAGTTGTTATGCGACCTGGTGCCACACACGTGCTTCAAACCTCCGC

Fig. 9a

09483265 "012000

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S Q L G D E V A A N F T A L F A P D I R 240
 AGTCAGCTGGGAGATGAGGTTGCGGCCAATTTCACTGCGCTCTTTGCACCCGACATCCGA
 661 -----+-----+-----+-----+-----+-----+-----+ 720
 TCAGTCGACCCTCTACTCCAACGCCGGTTAAAGTGACGCGAGAAACGTGGGCTGTAGGCT

 A R L E K H L P G V T L T D E D V V S L 260
 GCTCGCctCGAGAAGCATCTTCTGGCGTGACGCTGACAGACGAGGACGTTGTGAGTCTA
 721 -----+-----+-----+-----+-----+-----+-----+ 780
 CGAGCGgaGCTCTTCGTAGAAGGACCGCACTGCGACTGTCTGCTCCTGCAACAGTCAGAT

 M D M C P F D T V A R T S D A S Q L S P 280
 ATGGACATGTGTcCGTTTGATACGGTAGCGCGCACCAGCGACGCAAGTCAGCTGTCAACCG
 781 -----+-----+-----+-----+-----+-----+-----+ 840
 TACCTGTACACAgGCAAACTATGCCATCGCGCGTGGTTCGCTGCGTTTCACTCGACAGTGGC

 F C Q L F T H N E W K K Y D Y L Q S L G 300
 TTCTGTCAACTCTTCACTCACAATGAGTGGAAGAAGTACgACTACCTTCAGTCCTTGGGC
 841 -----+-----+-----+-----+-----+-----+-----+ 900
 AAGACAGTTGAGAAGTGAGTGTTACTCACCTTCTTCATGcTGATGGAAGTCAGGAACCCG

 K Y Y G Y G A G N P L G P A Q G I G F T 320
 AAGTACTACGGCTACGGCGCAGGCAACCCTCTGGGACCGGCTCAGGGGATAGGGTTCCAC
 901 -----+-----+-----+-----+-----+-----+-----+ 960
 TTCATGATGCCGATGCCGCGTCCGTTGGGAGACCCTGGCCGAGTCCCCTATCCCAAGTGG

 N E L I A R L T R S P V Q D H T S T N S 340
 AACGAGCTGATTGCCCCGTTGACgCGTTTCGCCAGTGACAGGACCACACCAGCACTAACTCG
 961 -----+-----+-----+-----+-----+-----+-----+ 1020
 TTGCTCGACTAACGGGCCAACTGcGCAAGCGGTACGTCCTGGTGTGGTCTGATTGAGC

 T L V S N P A T F P L N A T M Y V D F S 360
 ACTCTAGTCTCCAACCCGGCCACCTTCCCCTTGAACGCTACCATGTACGTCGACTTTTCA
 1021 -----+-----+-----+-----+-----+-----+-----+ 1080
 TGAGATCAGAGGTTGGGCCGTTGGAAGGGCAACTTGCGATGGTACATGCAGCTGAAAAGT

 H D N S M V S I F F A L G L Y N G T E P 380
 CACGACAACAGCATGGTTTCCATCTTCTTTGCATTGGGCCTGTACAACGGCACTGAACCC
 1081 -----+-----+-----+-----+-----+-----+-----+ 1140
 GTGCTGTTGTCTACCAAAGGTAGAAGAAACGTAACCCGGACATGTTGCCGTGACTTGGG

 L S R T S V E S A K E L D G Y S A S W V 400
 TTGTCCCGGACCTCGGTGGAAGCGCCAAGGAATTGGATGGGTATTCTGCATCCTGGGTG
 1141 -----+-----+-----+-----+-----+-----+-----+ 1200
 AACAGGGCCTGGAGCCACCTTTTCGCGGTTCTTAACCTACCCATAAGACGTAGGACCCAC

 V P F G A R A Y F E T M Q C K S E K E P 420
 GTGCCTTTTCGGCGCGGAGCCTACTTCGAGACGATGCAATGCAAGTCGGAAGGAGCCT
 1201 -----+-----+-----+-----+-----+-----+-----+ 1260
 CACGGAAGCCGCGCGCTCGGATGAAGCTCTGCTACGTTACGTTTACGCTTTTCTCCTCGGA

 L V R A L I N D R V V P L H G C D V D K 440
 CTTGTTTCGCGCTTTGATTAATGACCGGTTGTGCCACTGCATGGCTGCGATGTGGACAAG
 1261 -----+-----+-----+-----+-----+-----+-----+ 1320
 GAACAAGCGCGAAACTAATTACTGGCCCAACACGGTGACGTACCGACGCTACACCTGTTC

Fig. 9b

00210"5323460

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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L G R C K L N D F V K G L S W A R S G G 460
CTGGGGCGATGCAAGCTGAATGACTTTGTCAAGGGATTGAGTTGGGCCAGATCTGGGGGC
1321 -----+-----+-----+-----+-----+ 1380
GACCCCGCTACGTTGACTTACTGAAACAGTTCCTAACTCAACCCGGTCTAGACCCCG

N W G E C F S * 467
AACTGGGGAGAGTGCTTTAGTTGA
1381 -----+-----+----- 1404
TTGACCCCTCTCACGAAATCAACT

```

Fig. 9c

000210" 59288450

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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CP-1

Eco RI M G V F V V L L S I A T L F G S T
 TATATGAATTCATGGGCGTGTTCGTGCTACTGTCCATTGCCACCTTGTTCGGTTCCA
 1 -----+-----+-----+-----+-----+ 60
 ATATACTTAAGTACCCGCACAAGCAGCACGATGACAGGTAACGGTGAACAAGCCAAGGT

S G T A L G P R G N S H S C D T V D G G
 CATCCGGTACCGCCTTGGGTCTCGTGGTAATTCTCACTCTTGTGACACTGTTGACGGTG
 61 -----+-----+-----+-----+-----+ 120
 GTAGGCCATGGCGGAACCCAGGAGCACCATTAAAGAGTGAGAACACTGTGACAACCTGCCAC

CP-2

CP-3

Y Q C F P E I S H L W G Q Y S P Y F S L
 GTTACCAATGTTTCCCAGAAATTTCTCACTTGTGGGGTCAATACTCTCCATACTTCTCTT
 121 -----+-----+-----+-----+-----+ 180
 CAATGGTTACAAAGGGTCTTTAAAGAGTGAACACCCAGTTATGAGAGGTATGAAGAGAA

E D E S A I S P D V P D D C R V T F V Q
 TGGAAGACGAATCTGCTATTTCTCCAGACGTTCCAGACGACTGTAGAGTTACTTTCGTTT
 181 -----+-----+-----+-----+-----+ 240
 ACCTTCTGCTTAGACGATAAAGAGGTCTGCAAGGTCTGCTGACATCTCAATGAAAGCAAG

CP-4.7

CP-5.7

V L S R H G A R Y P T D S K G K K Y S A
 AAGTTTTGTCTAGACACGGTGTAGATACCCAACTgactCTAAGggtAAGaagTACTCTG
 241 -----+-----+-----+-----+-----+ 300
 TTCAAAACAGATCTGTGCCACGATCTATGGGTTGActgAGATTCCcaTTcttCATGAGAC

L I E A I Q K N A T A F K G K Y A F L K
 CTTTGATTGAAGCTATTCAAAAGAACGCTACTGCTTTCAAGGGTAAGTACGCTTTCTTGA
 301 -----+-----+-----+-----+-----+ 360
 GAAACTAACTTCGATAAGTTTTCTTGCGATGACGAAAGTTCCCATTCTGCGAAAGAAGT

CP-6

CP-7

T Y N Y T L G A D D L T P F G E N Q M V
 AGACTTACAACCTACACTTTGGGTGCTGACGACTTGACTCCATTTCGGTGAAAACCAATGG
 361 -----+-----+-----+-----+-----+ 420
 TCTGAATGTTGATGTGAAACCCACGACTGCTGAACTGAGGTAAGCCACTTTTGGTTTACC

N S G I K F Y R R Y K A L A R K I V P F
 TTAACCTCTGGTATTAAGTTCTACAGAAGATAACAAGGCTTTGGCTAGAAAGATTGTTCCAT
 421 -----+-----+-----+-----+-----+ 480
 AATTGAGACCATAATTCAAGATGTCTTCTATGTTCCGAAACCGATCTTTCTAACAAGGTA

CP-8.7

CP-9

I R A S G S S R V I A S A E K F I E G F
 TCATTAGAGCTTCTGGTTCTtctAGAGTTATTGCTTCTGCTGAAAAGTTTCATTGAAGGTT
 481 -----+-----+-----+-----+-----+ 540
 AGTAATCTCGAAGACCAAGAgaTCTCAATAACGAAGACGACTTTTCAAGTAACCTCCAA

Q S A K L A D P G S Q P H Q A S P V I D
 TCCAATCTGCTAAGTTGGCTGACCCAGGTTCTCAACCACACCAAGCTTCTCCAGTTATTG
 541 -----+-----+-----+-----+-----+ 600
 AGGTTAGACGATTCAACCGACTGGGTCCAAGAGTTGGTGTGGTTTCAAGAGGTCAATAAC

Fig. 10a

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CP-10.7

CP-11.7

V I I S E A S S Y N N T L D P G T C T A
 ACGTTATTATTtctGAcgctTCTtctTACAACAACACTTTGGACccaGGTACTTGTACTG
 601 -----+-----+-----+-----+-----+-----+-----+ 660
 TGCAATAATAAagaCTgCGaAGGagaATGTTGTTGTGAAACCTGggtCCATGAACATGAC

F E D S E L A D T V E A N F T A L F A P
 CTTTCGAAGACTCTGAATTGgctGACactGTTGAAGCTAACTTCACTGCTTTGTTTCGCTC
 661 -----+-----+-----+-----+-----+-----+ 720
 GAAAGCTTCTGAGACTTAACcgaCTGtgaCAACTTCGATTGAAGTGACGAAACAAGCGAG

CP-12.7

A I R A R L E A D L P G V T L T D T E V
 CAGCTATTAGAGCTAGATTGGAAGCTGACTTGCCAGGTGTTACTTTGACTGACactgaaG
 721 -----+-----+-----+-----+-----+-----+ 780
 GTCGATAATCTCGATCTAACCTTCGACTGAACGGTCCACAATGAAACTGACTGtgacttc

CP-13.7

T Y L M D M C S F E T V A R T S D A T E
 TTactTACTTGATGGACATGTGTtctTTCGAAACTGTTGCTAGAACTTCTGACGCTACTG
 781 -----+-----+-----+-----+-----+-----+ 840
 AAtgaATGAACTACCTGTACACAagaAAGCTTTGACAACGATCTTGAAGACTGCGATGAC

L S P F C A L F T H D E W R H Y D Y L Q
 AATTGTCTCCATTCTGTGCTTTGTTCACTCACGACGAATGGAGAcacTACGACTACTTGC
 841 -----+-----+-----+-----+-----+-----+ 900
 TTAACAGAGGTAAGACACGAAACAAGTGAGTGCTTGCTTACCTCTgtgATGCTGATGAACG

CP-14.7

CP-15.7

S L K K Y Y G H G A G N P L G P T Q G V
 AATCTTTGaagAAGTACTACGGTcacGGTGCTGGTAACCCATTGGGTCCAactCAAGGTG
 901 -----+-----+-----+-----+-----+-----+ 960
 TTAGAAActtcTTCATGATGCCAgtgCCACGACCATTGGGTAACCCAGGTtgaGTTCCAC

G F A N E L I A R L T R S P V Q D H T S
 TTGGTTTCGCTAACGAATTGATTGCTAGATTGACTAGATCTCCAGTTCAGACCACACTT
 961 -----+-----+-----+-----+-----+-----+ 1020
 AACCAAAGCGATTGCTTAACCTAACGATCTAACTGATCTAGAGGTCAAGTTCTGGTGTGAA

CP-16

CP-17.7

T N H T L D S N P A T F P L N A T L Y A
 CTACTAACCACACTTTGGACTCTAACCCAGCTACTTTCCCATTTGAACGCTACTTTGTACG
 1021 -----+-----+-----+-----+-----+-----+ 1080
 GATGATTGGTGTGAAACCTGAGATTGGGTGATGAAAGGGTAACCTGCGATGAAACATGC

D F S H D N G I I S I F F A L G L Y N G
 CTGACTTCTCTCACGACAACggtattATTTCTATTTTCTTCGCTTTGGGTTTGTACAACG
 1081 -----+-----+-----+-----+-----+-----+ 1140
 GACTGAAGAGAGTGCTGTTGccataaTAAAGATAAAAGAAGCGAAACCCAAACATGTTGC

CP-18.7

CP-19.7

T A P L S T T S V E S I E E T D G Y S S
 GTACTGCTCCATTGTCTACTACTTCTGTTGAATCTATTGAAGAACTGACGGTTACTCTt
 1141 -----+-----+-----+-----+-----+-----+ 1200
 CATGACGAGGTAACAGATGATGAAGACAACCTTAGATAACTTCTTTGACTGCCAATGAGAA

Fig. 10b

00000 " 5288465

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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      A W T V P F A S R A Y V E M M Q C Q A E
ctgctTGGACTGTTCCATTGctttctAGAGCTTACGTTGAAATGATGCAATGTCAAGCTG
1201 -----+-----+-----+-----+-----+-----+ 1260
      gacgaACCTGACAAGGTAAGcgaagaTCTCGAATGCAACTTTACTACGTTACAGTTTCGAC
                                CP-20
                                CP-21
      K E P L V R V L V N D R V V P L H G C A
AAAAGGAACCATTGGTTAGAGTTTTGGTTAACGACAGAGTTGTTCCATTGCACGGTTGTG
1261 -----+-----+-----+-----+-----+-----+ 1320
      TTTTCCTTGGTAACCAATCTCAAAACCAATTGCTGTCTCAACAAGGTAACGTGCCAACAC

      V D K L G R C K R D D F V E G L S F A R
CTGTTGACAAGTTGGGTAGATGTAAGAGAGACGACTTCGTTGAAGGTTTGTCTTTTCGCTA
1321 -----+-----+-----+-----+-----+-----+ 1380
      GACAACTGTTCAACCCATCTACATTCTCTCTGCTGAAGCAACTTCCAAACAGAAAGCGAT
                                CP-22
      S G G N W A E C F A * Eco RI
GATCTGGTGGTAACTGGGCTGAATGTTTCGCTTAAGAATTCATATA
1381 -----+-----+-----+-----+-----+-----+ 1426
      CTAGACCACCATTGACCCGACTTACAAAGCGAATTCCTTAAGTATAT

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0048825 012000

Fig. 10c

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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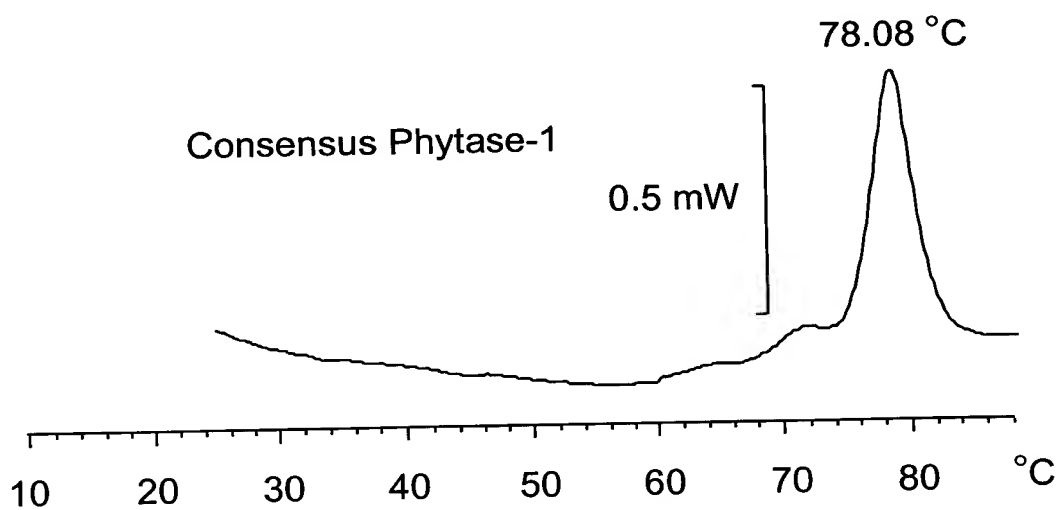
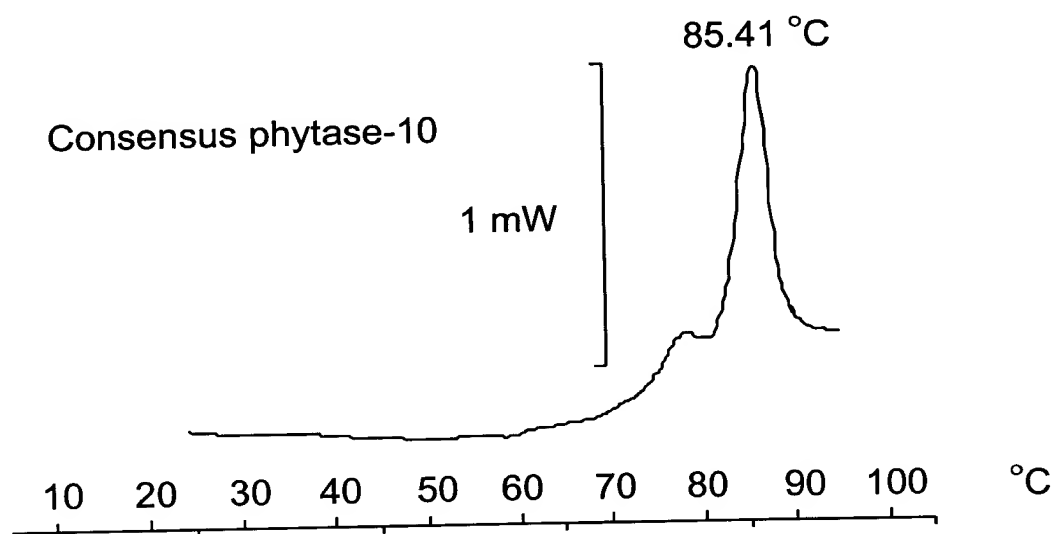


Fig. 11

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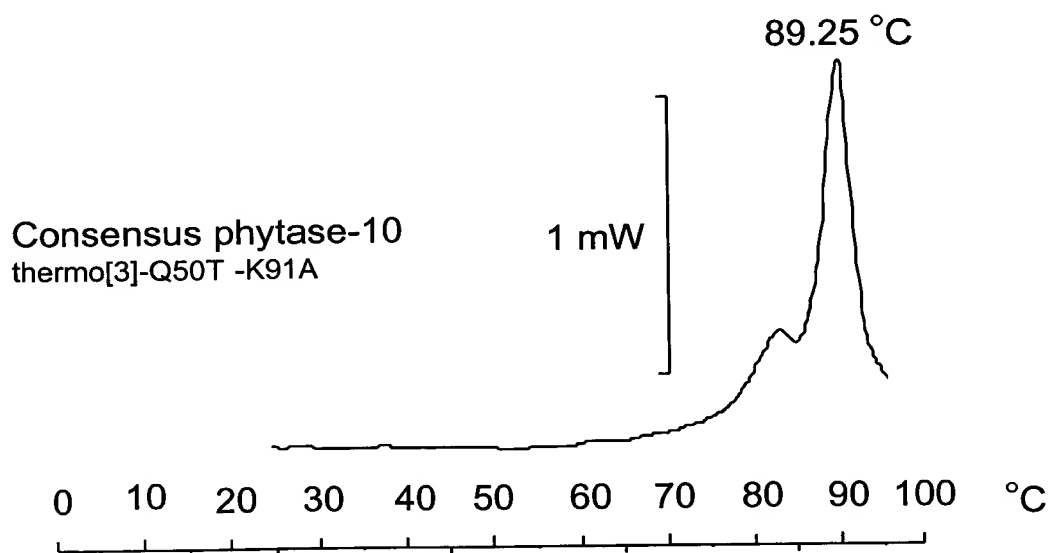
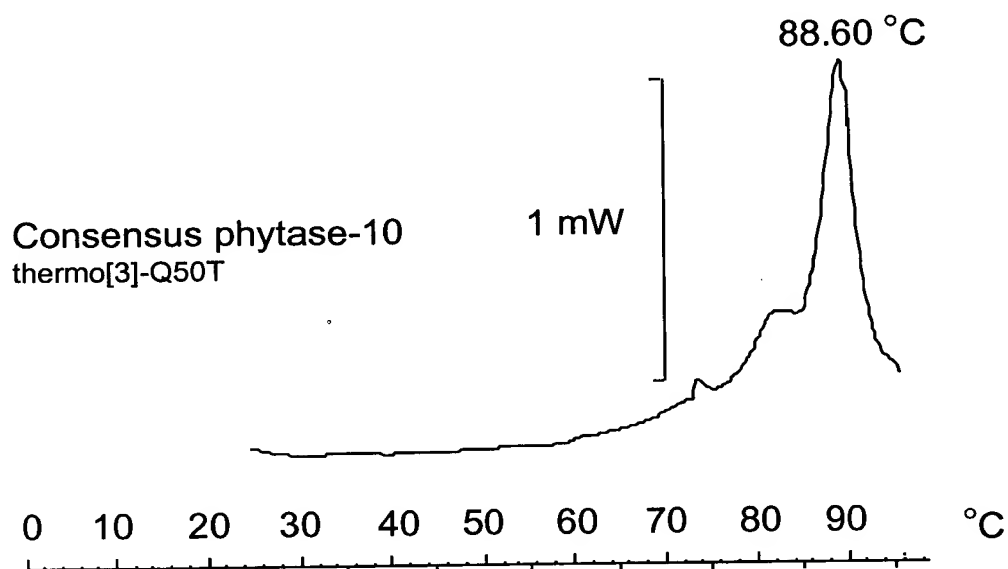


Fig. 12

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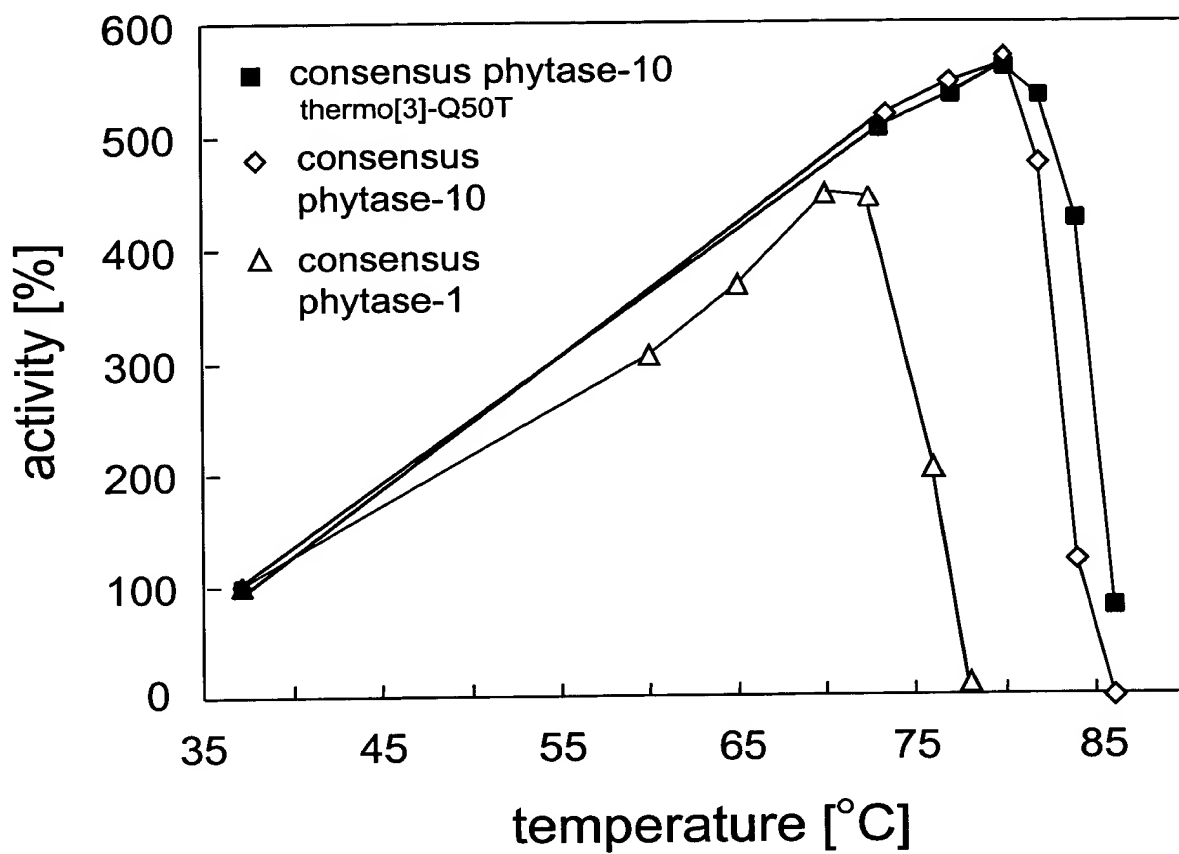


Fig. 13

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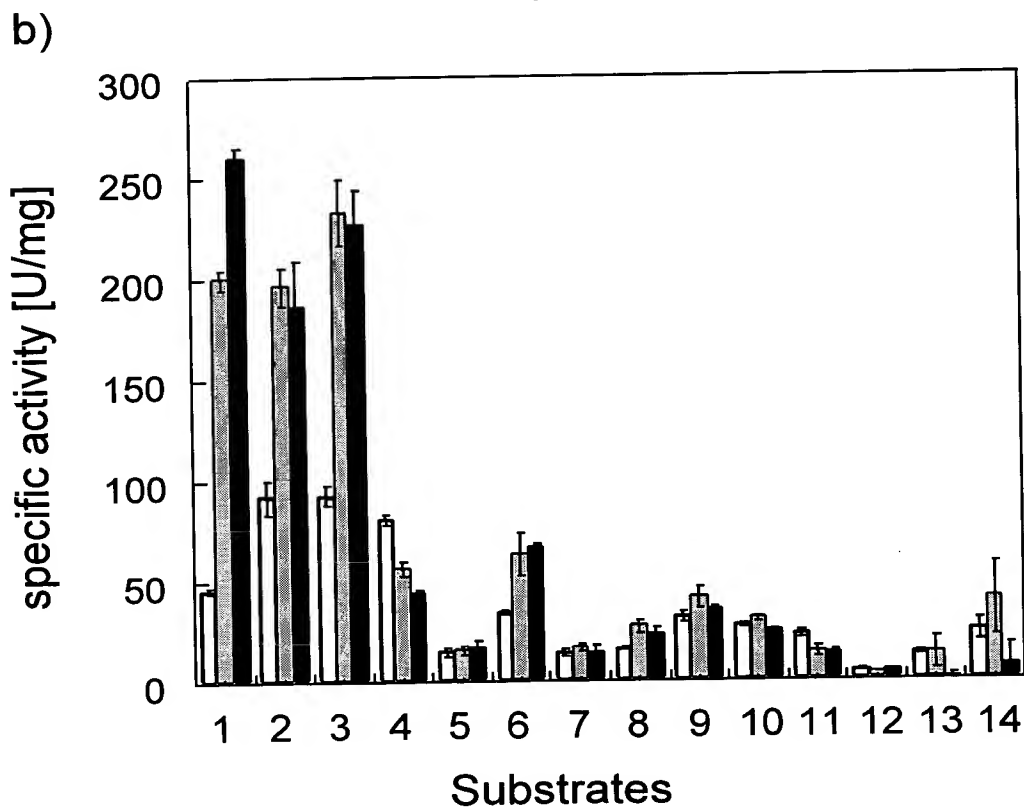
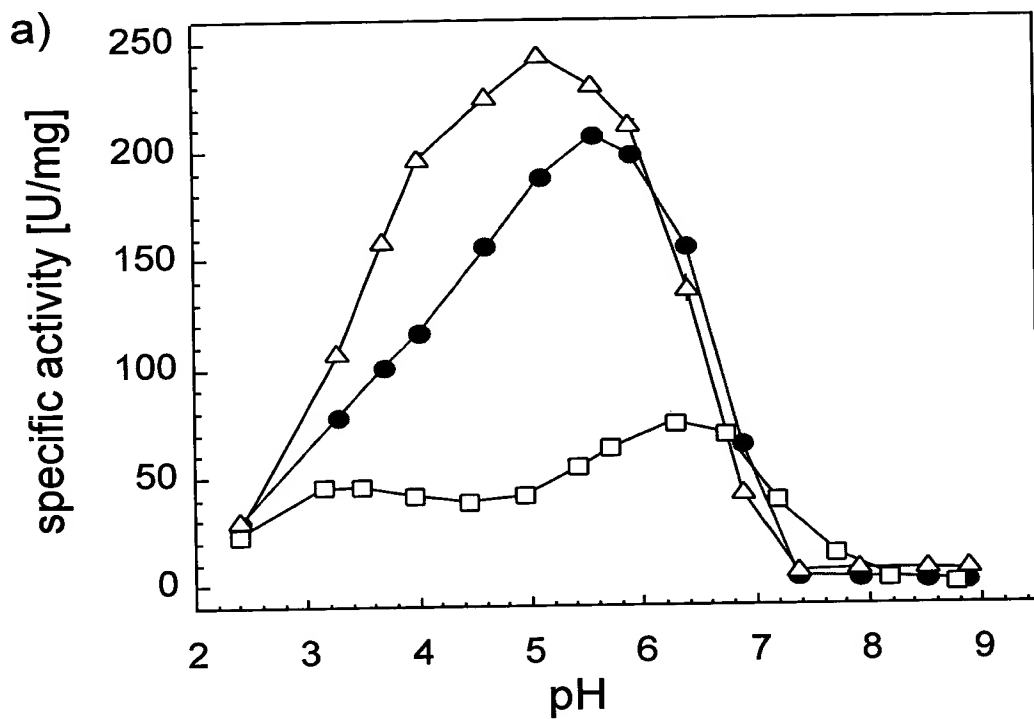


Fig. 14

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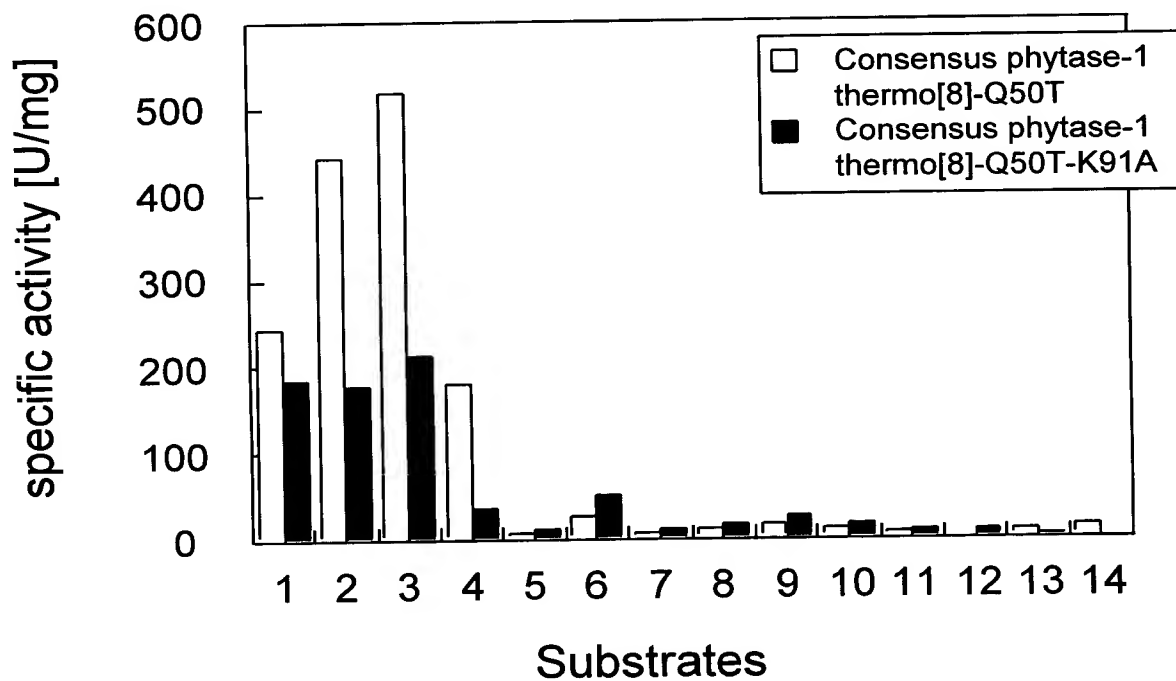
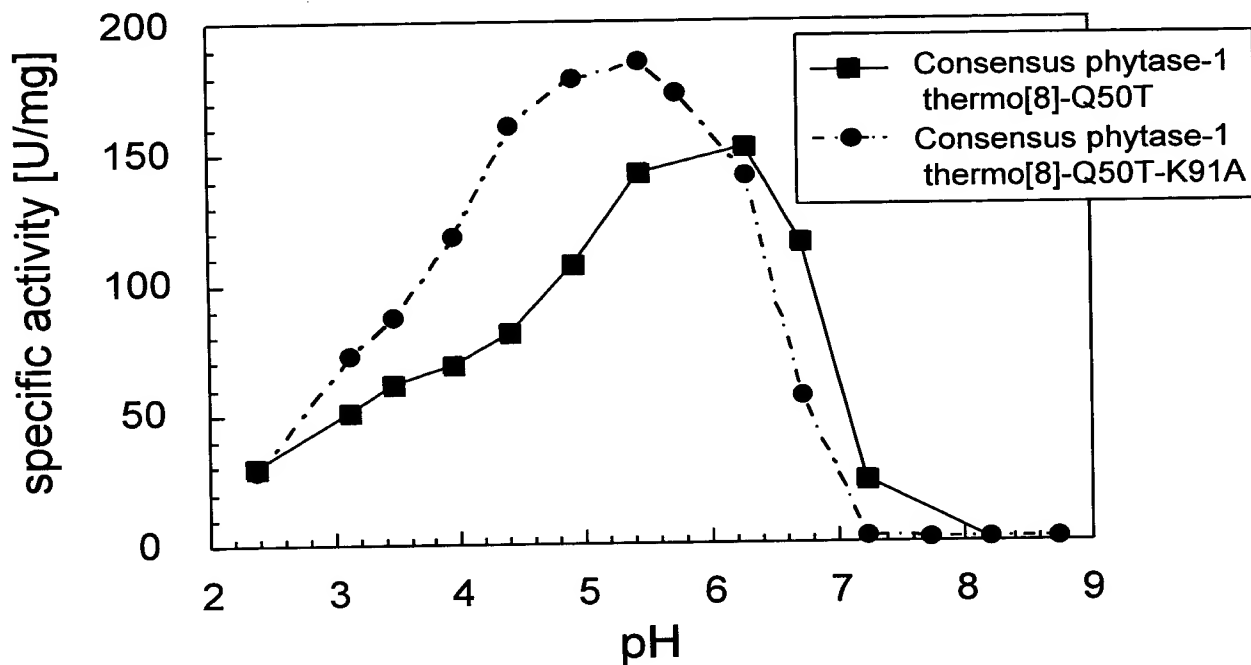


Fig. 15

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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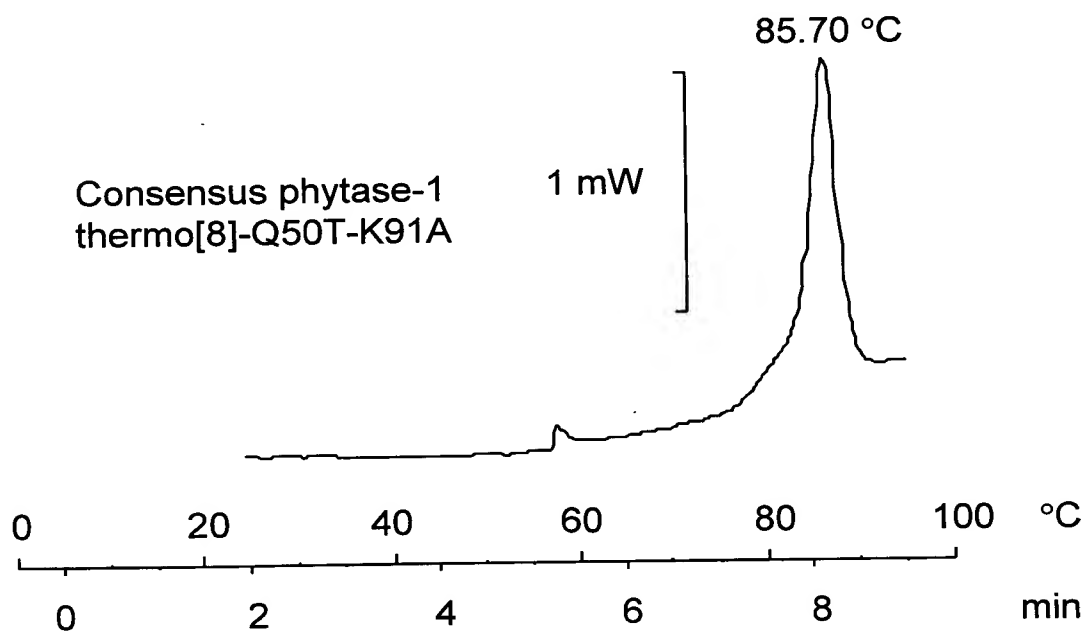
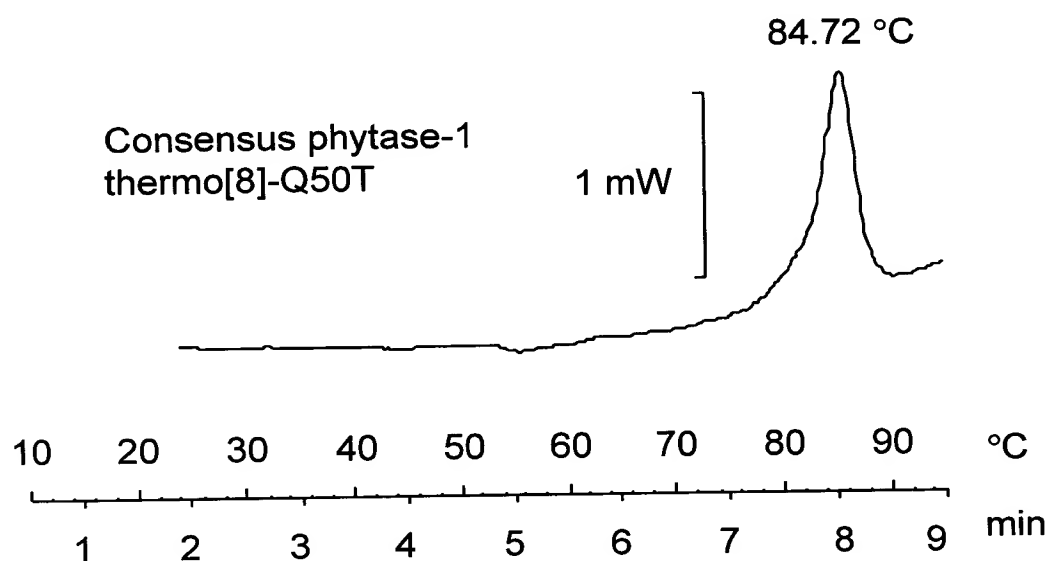


Fig. 16

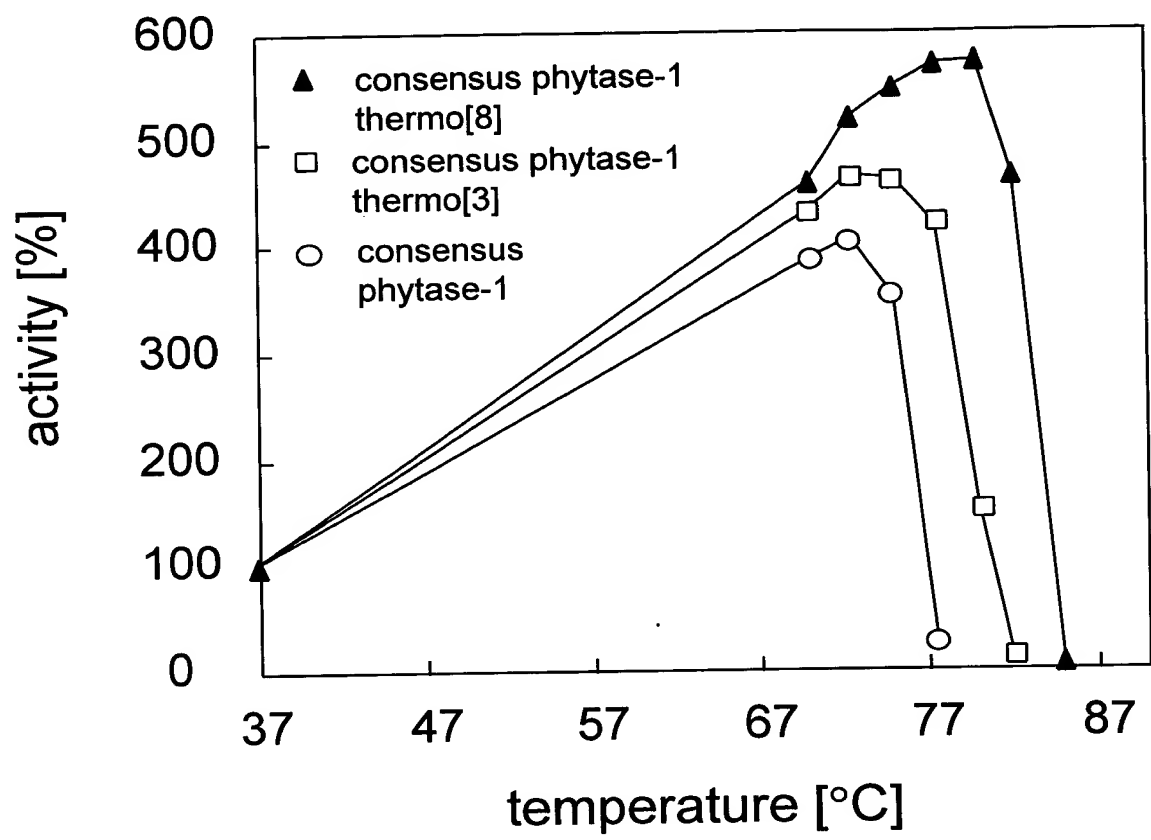


Fig. 17

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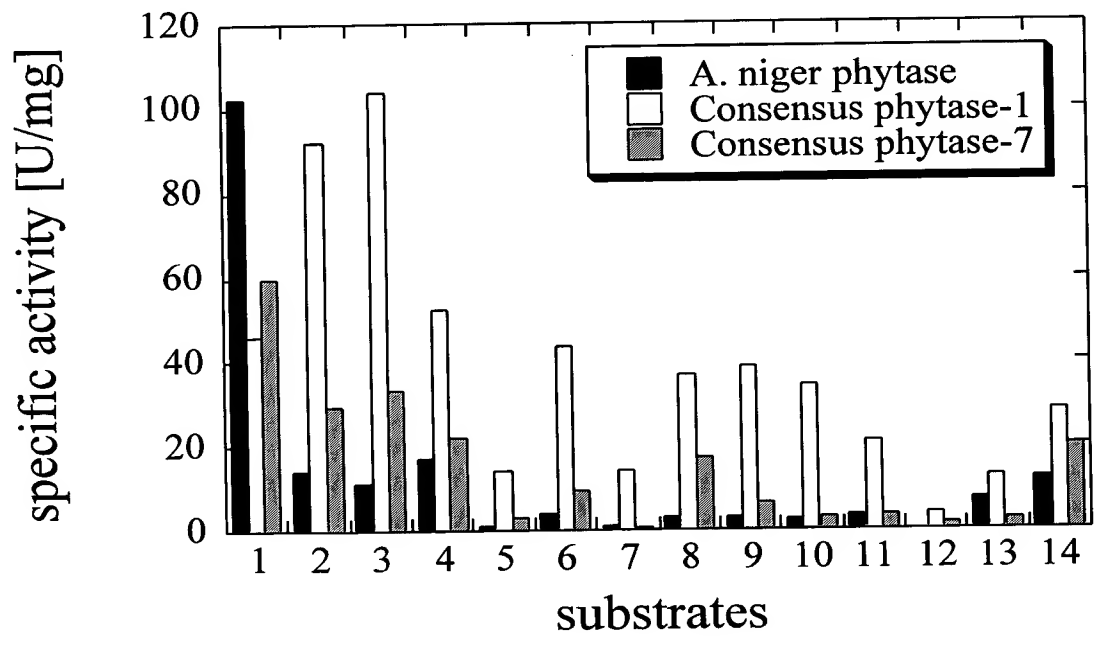
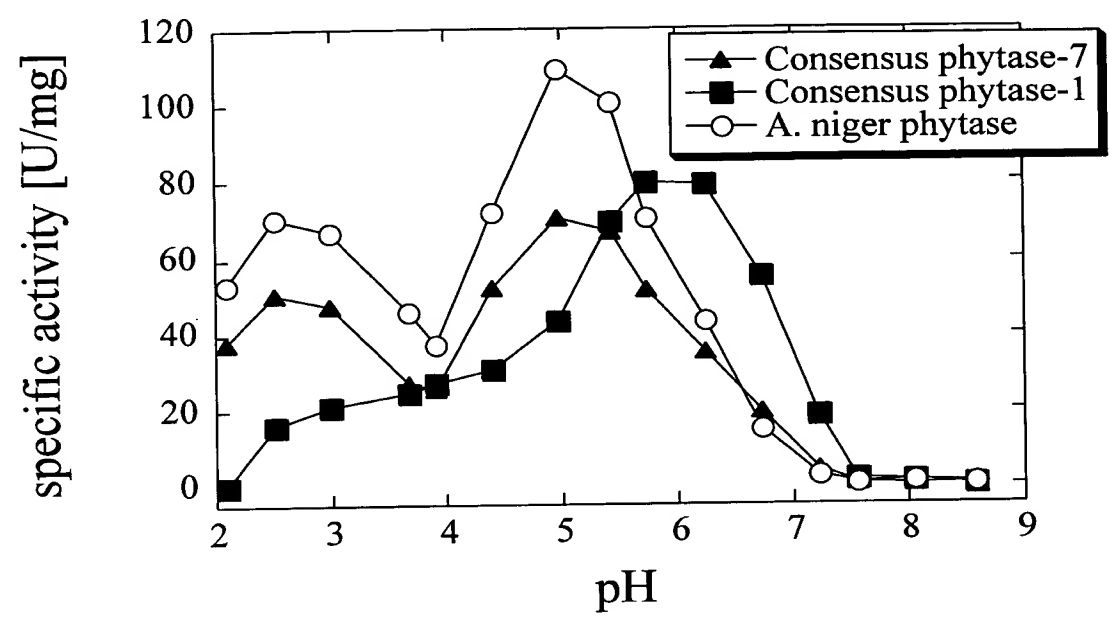


Fig. 18

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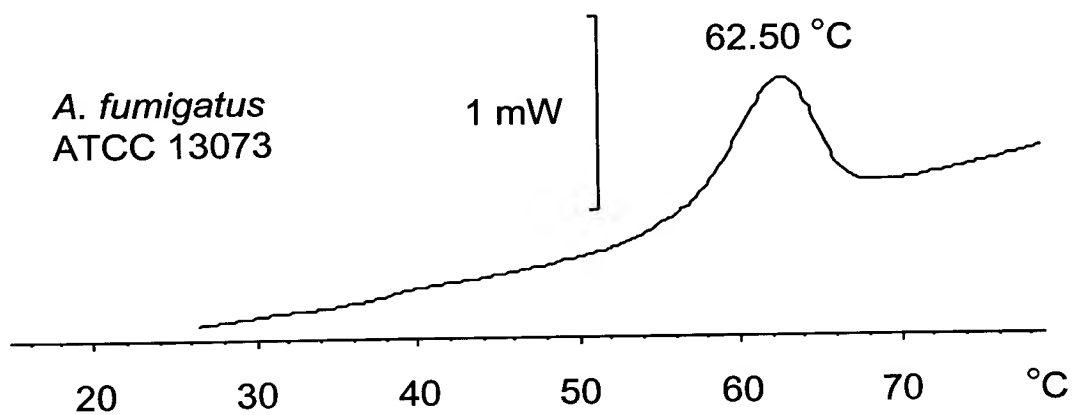
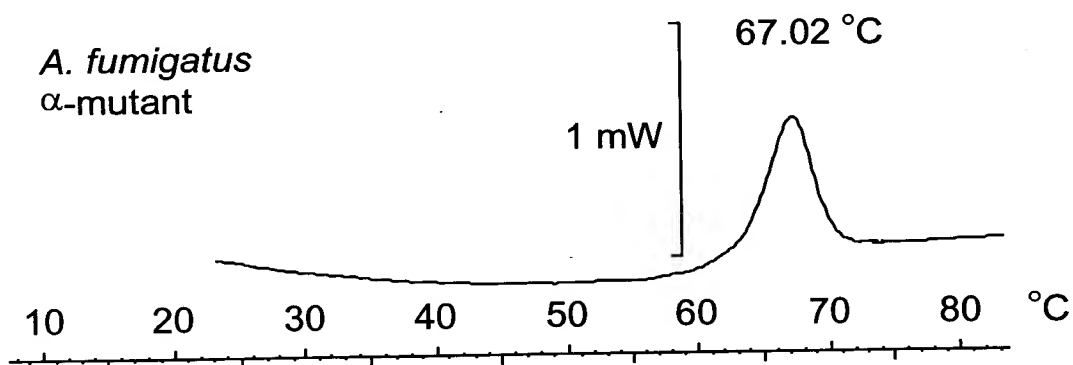


Fig. 19

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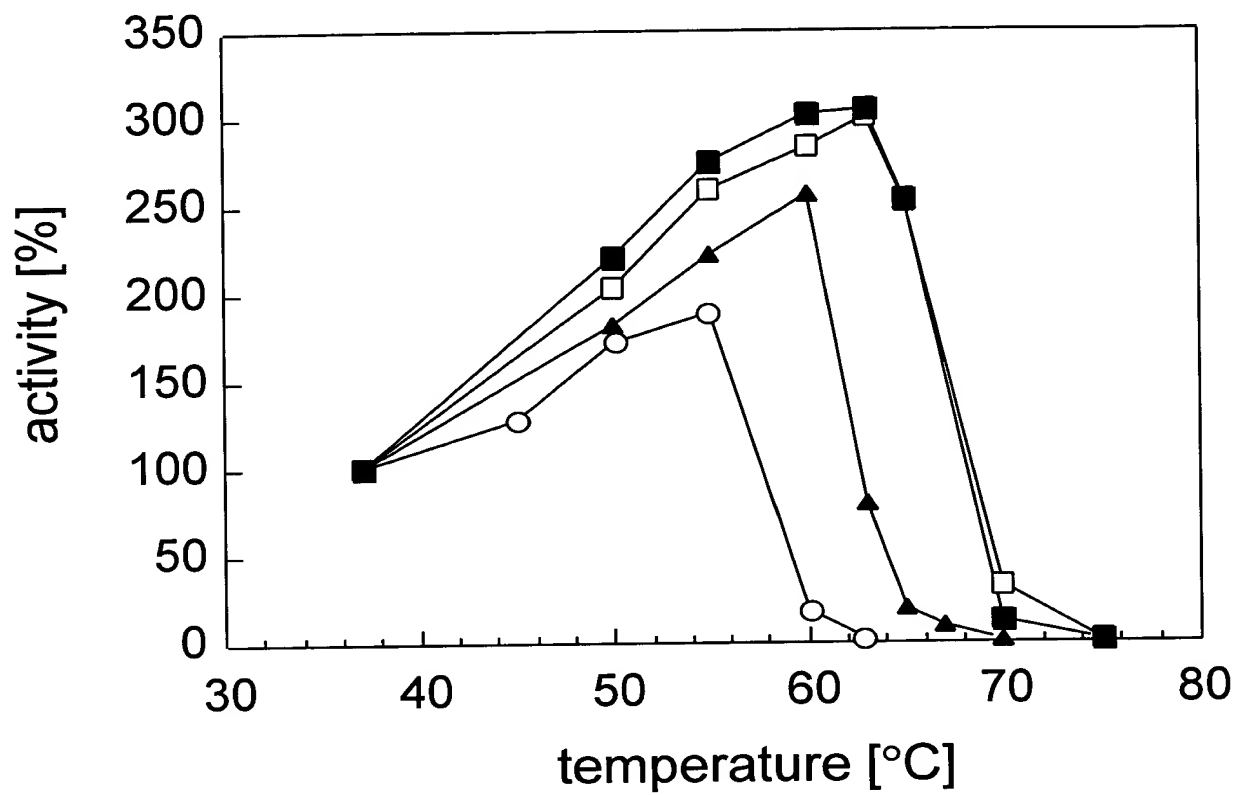


Fig. 20

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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1 MGVFVLLSI ATLFGSTSGT ALGPRGNSHS CDTVDGGYQC FPEISSNWSP

51 YSPYFSLADE SAISPDVPKG CRVTFVQVLQ RHGARFPTSG AATRISALIE

101 AIQKNATAFK GKYAFLKTYN YTLGADDLVP FGANQSSQAG IKFYRRYKAL

151 ARKIVPFIRA SGSDRVIDSA TNWIEGFQSA KLADPGANPH QASPVINVII

201 PEGAGYNNTL DHGLCTAFEE SELGDDVEAN FTAVFAPPPIR ARLEAHLPGV

251 NLTDEDVVNL MDMCPFDIVA RTSDATELSP FCDLFTHDEW IQYDYLGDLD

301 KYYGTGAGNP LGPAQGVGFV NELIARLTHS PVQDHTSTNH TLDSNPATFP

351 LNATLYADFS HDNTMVAIFF ALGLYNGTKP LSTTSVESIE ETDGYSASWL

401 VPFSSARMYVE MMQCEAEKEP LVRVLVNDRV VPLHGCGVDK LGRCKRDDFV

451 EGLSFARSGG NWEECF

Fig. 21

000210" 59288160

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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ATGGGCGTGTTCGTGCTACTGTCCATTGCCACCTTGTTTCGGTTCCACATCCGGTACC
1  -----+-----+-----+-----+-----+-----+ 60
TACCCGCACAAGCAGCAGCATGACAGGTAACGGTGGAACAAGCCAAGGTGTAGGCCATGG

M G V F V V L L S I A T L F G S T S G T -

GCCTTGGGTCCTCGTGGTAATTCTCACTCTTGTGACACTGTTGACGGTGGTTACCAATGT
61 -----+-----+-----+-----+-----+-----+ 120
CGGAACCCAGGAGCACCATTAAGAGTGAGAACACTGTGACAACTGCCACCAATGGTTACA

A L G P R G N S H S C D T V D G G Y Q C -

TTCCAGAAATTTCTCACTTGTGGGGTACCTACTCTCCATACTTCTCTTTGGCAGACGAA
121 -----+-----+-----+-----+-----+-----+ 180
AAGGGTCTTTTAAAGAGTGAACACCCCATGGATGAGAGGTATGAAGAGAAACCGTCTGCTT

F P E I S H L W G T Y S P Y F S L A D E -

TCTGCTATTTCTCCAGACGTCCCAAAGGACTGTAGAGTTACTTTTCGTTCAAGTTTTGTCT
181 -----+-----+-----+-----+-----+-----+ 240
AGACGATAAAGAGGTCTGCAGGGTTTCTGACATCTCAATGAAAGCAAGTTCAAAACAGA

S A I S P D V P K D C R V T F V Q V L S -

AGACACGGTGCTAGATACCCAACTTCTTCTAAGTCTAAGGCTTACTCTGCTTTGATTGAA
241 -----+-----+-----+-----+-----+-----+ 300
TCTGTGCCACGATCTATGGGTTGAAGAAGATTGAGATTCCGAATGAGACGAAACTAAGT

R H G A R Y P T S S K S K A Y S A L I E -

GCTATTCAAAAGAACGCTACTGCTTTCAAGGGTAAGTACGCTTTCTTGAAGACTTACAAC
301 -----+-----+-----+-----+-----+-----+ 360
CGATAAGTTTTCTTGCATGACGAAAGTTCCCATTCATGCGAAAGAACTTCTGAATGTTG

A I Q K N A T A F K G K Y A F L K T Y N -

TACACTTTGGGTGCTGACGACTTGACTCCATTTCGGTGAAAACCAAATGGTTAACTCTGGT
361 -----+-----+-----+-----+-----+-----+ 420
ATGTGAAACCCACGACTGCTGAACTGAGGTAAGCCACTTTTGGTTTACCAATTGAGACCA

Y T L G A D D L T P F G E N Q M V N S G -

ATTAAGTTCTACAGAAGATACAAGGCTTTGGCTAGAAAGATTGTTCCATTCATTAGAGCT
421 -----+-----+-----+-----+-----+-----+ 480
TAATTCAAGATGTCTTCTATGTTCCGAAACCGATCTTTCTAACAAGGTAAGTAATCTCGA

I K F Y R R Y K A L A R K I V P F I R A -

TCTGGTTCTGACAGAGTTATTGCTTCTGCTGAAAAGTTCATTGAAGGTTTCCAATCTGCT
481 -----+-----+-----+-----+-----+-----+ 540
AGACCAAGACTGTCTCAATAACGAAGACGACTTTTCAAGTAACTTCCAAGGTTAGACGA

S G S D R V I A S A E K F I E G F Q S A -

```

Fig. 22a

0948265-012000

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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541 AAGTTGGCTGACCCAGGTTCTCAACCACCAAGCTTCTCCAGTTATTAACGTGATCATT
 -----+-----+-----+-----+-----+ 600
 TTCAACCGACTGGGTCCAAGAGTTGGTGTGGTTTGAAGAGGTCAATAATTGCACTAGTAA

 K L A D P G S Q P H Q A S P V I N V I I -

 CCAGAAGGATCCGGTTACAACAACACTTTGGACCATGGTCTTTGTACTGCTTTTGAAGAC
 601 -----+-----+-----+-----+-----+ 660
 GGTCTTCCTAGGCCAATGTTGTTGTGAAACCTGGTACCAGAAACATGACGAAAGCTTCTG

 P E G S G Y N N T L D H G L C T A F E D -

 TCTACCCTAGGTGACGACGTTGAAGCTAACTTCACTGCTTTGTTTCGCTCCAGCTATTAGA
 661 -----+-----+-----+-----+-----+ 720
 AGATGGGATCCACTGCTGCAACTTCGATTGAAGTGACGAAACAAGCGAGGTGCGATAATCT

 S T L G D D V E A N F T A L F A P A I R -

 GCTAGATTGGAAGCTGACTTGCCAGGTGTTACTTTGACTGACGAAGACGTTGTTTACTTG
 721 -----+-----+-----+-----+-----+ 780
 CGATCTAACCTTCGACTGAACGGTCCACAATGAACTGACTGCTTCTGCAACAAATGAAC

 A R L E A D L P G V T L T D E D V V Y L -

 ATGGACATGTGTCCATTTCGACACTGTGCGTAGAACTTCTGACGCTACTGAATTGTCTCCA
 781 -----+-----+-----+-----+-----+ 840
 TACCTGTACACAGGTAAGCTGTGACAGCGATCTTGAAGACTGCGATGACTTAACAGAGGT

 M D M C P F D T V A R T S D A T E L S P -

 TTCTGTGCTTTGTTCACTCACGACGAATGGATCCAATACGACTACTTGCAAAGCTTGGGT
 841 -----+-----+-----+-----+-----+ 900
 AAGACACGAAACAAGTGAGTGCTGCTTACCTAGGTTATGCTGATGAACGTTTCGAACCCA

 F C A L F T H D E W I Q Y D Y L Q S L G -

 AAGTACTACGGTTACGGTGCTGGTAACCCATTGGGTCCAGCTCAAGGTGTTGGTTTCGCT
 901 -----+-----+-----+-----+-----+ 960
 TTCATGATGCCAATGCCACGACCATTGGGTAACCCAGGTGAGTTCCACAACCAAGCGA

 K Y Y G Y G A G N P L G P A Q G V G F A -

 AACGAATTGATTGCTAGATTGACTCACTCTCCAGTTCAAGACCACACTTCTACTAACCAC
 961 -----+-----+-----+-----+-----+ 1020
 TTGCTTAACCTAACGATCTAACTGAGTGAGAGGTCAAGTTCTGGTGTGAAGATGATTGGTG

 N E L I A R L T H S P V Q D H T S T N H -

 ACTTTGGACTCTAACCCAGCTACTTTCCCATTGAACGCTACTTTGTACGCTGACTTCTCT
 1021 -----+-----+-----+-----+-----+ 1080
 TGAAACCTGAGATTGGGTGCGATGAAAGGGTAACTTGCGATGAAACATGCGACTGAAGAGA

 T L D S N P A T F P L N A T L Y A D F S -

Fig. 22b

09488265-012000

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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1081 CACGACAACACTATGATATCTATTTTCTTCGCTTTGGGTTTGTACAACGGTACCAAGCCA
 -----+-----+-----+-----+-----+-----+ 1140
 GTGCTGTTGTGATACTATAGATAAAAGAAGCGAAACCCAAACATGTTGCCATGGTTCGGT

 H D N T M I S I F F A L G L Y N G T K P -

 1141 TTGTCTACTACTTCTGTTGAATCTATTGAAGAACTGACGGTTACTCTGCTTCTTGGA
 -----+-----+-----+-----+-----+-----+ 1200
 AACAGATGATGAAGACAACCTTAGATAAATTCTTTGACTGCCAATGAGACGAAGAACCTGA

 L S T T S V E S I E E T D G Y S A S W T -

 1201 GTTCCATTTCGCTGCTAGAGCTTACGTTGAAATGATGCAATGTCAAGCTGAAAAGGAACCA
 -----+-----+-----+-----+-----+-----+ 1260
 CAAGGTAAGCGACGATCTCGAATGCAACTTTACTACGTTACAGTTCGACTTTTCTTGGT

 V P F A A R A Y V E M M Q C Q A E K E P -

 1261 TTGGTTAGAGTTTGGTTAACGACAGAGTTGTTCCATTGCACGGTTGTGCTGTTGACAAG
 -----+-----+-----+-----+-----+-----+ 1320
 AACCAATCTCAAAACCAATTGCTGTCTCAACAAGGTAACGTGCCAACACGACAACCTGTTT

 L V R V L V N D R V V P L H G C A V D K -

 1321 TTGGGTAGATGTAAGAGAGACGACTTCGTTGAAGGTTTGTCTTTTCGCTAGATCTGGTGGT
 -----+-----+-----+-----+-----+-----+ 1380
 AACCCATCTACATTCTCTCTGCTGAAGCAACTTCCAAACAGAAAGCGATCTAGACCACCA

 L G R C K R D D F V E G L S F A R S G G -

 1381 AACTGGGCTGAATGTTTCGCTTAA
 -----+-----+-----+ 1404
 TTGACCCGACTTACAAAGCGAATT

 N W A E C F A *

Fig. 22c

09488265 012000

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

48/56

ATGGGCGTGTTTCGTGCTACTGTCCATTGCCACCTTGTTCGGTTCACATCCGGTACC
 1 -----+-----+-----+-----+-----+ 60
 TACCCGCACAAGCAGCAGCATGACAGGTAACGGTGAACAAGCCAAGGTGTAGGCCATGG

 M G V F V V L L S I A T L F G S T S G T -

 GCCTTGGGTCCTCGTGGTAATTCTCACTCTTGTGACACTGTTGACGGTGGTTACCAATGT
 61 -----+-----+-----+-----+-----+ 120
 CGGAACCCAGGAGCACCATTAAAGAGTGAGAACACTGTGACAACTGCCACCAATGGTTACA

 A L G P R G N S H S C D T V D G G Y Q C -

 TTCCAGAAATTTCTCACTTGTGGGGTACCTACTCTCCATACTTCTCTTTGGCAGACGAA
 121 -----+-----+-----+-----+-----+ 180
 AAGGGTCTTTTAAAGAGTGAACACCCCATGGATGAGAGGTATGAAGAGAAACCGTCTGCTT

 F P E I S H L W G T Y S P Y F S L A D E -

 TCTGCTATTTCTCCAGACGTCCCAAAGGACTGTAGAGTTACTTTGTTCAAGTTTTGTCT
 181 -----+-----+-----+-----+-----+ 240
 AGACGATAAAGAGGTCTGCAGGGTTTCCTGACATCTCAATGAAAGCAAGTTCAAAACAGA

 S A I S P D V P K D C R V T F V Q V L S -

 AGACACGGTGCTAGATACCCAACCTTCTTCTGCGTCTAAGGCTTACTCTGCTTTGATTGAA
 241 -----+-----+-----+-----+-----+ 300
 TCTGTGCCACGATCTATGGGTTGAAGAAGACGCAGATTCCGAATGAGACGAAACTAACTT

 R H G A R Y P T S S A S K A Y S A L I E -

 GCTATTCAAAAGAACGCTACTGCTTTCAAGGGTAAGTACGCTTTCTTGAAGACTTACAAC
 301 -----+-----+-----+-----+-----+ 360
 CGATAAGTTTTCTTGCATGACGAAAGTTCCCATTCATGCGAAAGAACTTCTGAATGTTG

 A I Q K N A T A F K G K Y A F L K T Y N -

 TACACTTTGGGTGCTGACGACTTGACTCCATTCCGGTGAAAACCAAATGGTTAACTCTGGT
 361 -----+-----+-----+-----+-----+ 420
 ATGTGAAACCCACGACTGCTGAACTGAGGTAAGCCACTTTTGGTTTACCAATTGAGACCA

 Y T L G A D D L T P F G E N Q M V N S G -

 ATTAAGTTCTACAGAAGATACAAGGCTTTGGCTAGAAAGATTGTTCCATTCATTAGAGCT
 421 -----+-----+-----+-----+-----+ 480
 TAATTCAAGATGTCTTCTATGTTCCGAAACCGATCTTTCTAACAAGGTAAGTAATCTCGA

 I K F Y R R Y K A L A R K I V P F I R A -

 TCTGGTTCTGACAGAGTTATTGCTTCTGCTGAAAAGTTCATTGAAGGTTTCCAATCTGCT
 481 -----+-----+-----+-----+-----+ 540
 AGACCAAGACTGTCTCAATAACGAAGACGACTTTTCAAGTAACTTCCAAAGGTTAGACGA

 S G S D R V I A S A E K F I E G F Q S A -

Fig. 23a

00020" 59285450

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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541 AAGTTGGCTGACCCAGGTTCTCAACCACACCAAGCTTCTCCAGTTATTAACGTGATCATT
 -----+-----+-----+-----+-----+-----+ 600
 TTCAACCGACTGGGTCCAAGAGTTGGTGTGGTTTCAAGAGGTCAATAATTGCACTAGTAA

 K L A D P G S Q P H Q A S P V I N V I I -

 CCAGAAGGATCCGGTTACAACAACACTTTGGACCATGGTCTTTGTACTGCTTTTCAAGAC
 601 -----+-----+-----+-----+-----+-----+ 660
 GGTCTTCTTAGGCCAATGTTGTTGTGAAACCTGGTACCAGAAACATGACGAAAGCTTCTG

 P E G S G Y N N T L D H G L C T A F E D -

 TCTACCCTAGGTGACGACGTTGAAGCTAACTTCACTGCTTTGTTTCGCTCCAGCTATTAGA
 661 -----+-----+-----+-----+-----+-----+ 720
 AGATGGGATCCACTGCTGCAACTTCGATTGAAGTGACGAAACAAGCGAGGTGATAATCT

 S T L G D D V E A N F T A L F A P A I R -

 GCTAGATTGGAAGCTGACTTGCCAGGTGTTACTTTGACTGACGAAGACGTTGTTTACTTG
 721 -----+-----+-----+-----+-----+-----+ 780
 CGATCTAACCTTCGACTGAACGGTCCACAATGAACTGACTGCTTCTGCAACAAATGAAC

 A R L E A D L P G V T L T D E D V V Y L -

 ATGGACATGTGTCCATTGACACTGTGCTAGAACTTCTGACGCTACTGAATTGTCTCCA
 781 -----+-----+-----+-----+-----+-----+ 840
 TACCTGTACACAGGTAAGCTGTGACAGCGATCTTGAAGACTGCGATGACTTAACAGAGGT

 M D M C P F D T V A R T S D A T E L S P -

 TTCTGTGCTTTGTTCACTCACGACGAATGGATCCAATACGACTACTTGCAAAGCTTGGGT
 841 -----+-----+-----+-----+-----+-----+ 900
 AAGACACGAAACAAGTGAGTGCTGCTTACCTAGGTTATGCTGATGAACGTTTCAACCCA

 F C A L F T H D E W I Q Y D Y L Q S L G -

 AAGTACTACGGTTACGGTGCTGGTAACCCATTGGGTCCAGCTCAAGGTGTTGGTTTCGCT
 901 -----+-----+-----+-----+-----+-----+ 960
 TTCATGATGCCAATGCCACGACCATTGGGTAAACCCAGGTGAGTTCCACAACCAAAGCGA

 K Y Y G Y G A G N P L G P A Q G V G F A -

 AACGAATTGATTGCTAGATTGACTCACTCTCCAGTTCAAGACCACACTTCTACTAACCAC
 961 -----+-----+-----+-----+-----+-----+ 1020
 TTGCTTAACTAACGATCTAACTGAGTGAGAGGTCAAGTTCTGGTGTGAAGATGATTGGTG

 N E L I A R L T H S P V Q D H T S T N H -

 ACTTTGGACTCTAACCCAGCTACTTTCCCATTTGAACGCTACTTTGTACGCTGACTTCTCT
 1021 -----+-----+-----+-----+-----+-----+ 1080
 TGAAACCTGAGATTGGGTGATGAAAGGTAACCTGCGATGAAACATGCGACTGAAGAGA

 T L D S N P A T F P L N A T L Y A D F S -

Fig. 23b

000210" 59288460

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

50/56

1081 CACGACAACACTATGATATCTATTTTCTTCGCTTTGGGTTTGTACAACGGTACCAAGCCA 1140
 -----+-----+-----+-----+-----+-----+
 GTGCTGTTGTGATACTATAGATAAAAGAAGCGAAACCCAAACATGTTGCCATGGTTCGGT

H D N T M I S I F F A L G L Y N G T K P -

1141 TTGTCTACTACTTCTGTTGAATCTATTGAAGAACTGACGGTTACTCTGCTTCTTGACT 1200
 -----+-----+-----+-----+-----+-----+
 AACAGATGATGAAGACAACCTTAGATAACTTCTTTGACTGCCAATGAGACGAAGAACCTGA

L S T T S V E S I E E T D G Y S A S W T -

1201 GTTCCATTGCTGCTAGAGCTTACGTTGAAATGATGCAATGTCAAGCTGAAAAGGAACCA 1260
 -----+-----+-----+-----+-----+-----+
 CAAGGTAAGCGACGATCTCGAATGCAACTTTACTACGTTACAGTTCGACTTTTCCTTGGT

V P F A A R A Y V E M M Q C Q A E K E P -

1261 TTGGTTAGAGTTTGGTTAACGACAGAGTTGTTCCATTGCACGGTTGTGCTGTTGACAAG 1320
 -----+-----+-----+-----+-----+-----+
 AACCAATCTCAAAACCAATTGCTGTCTCAACAAGGTAACGTGCCAACACGACAACCTGTTC

L V R V L V N D R V V P L H G C A V D K -

1321 TTGGGTAGATGTAAGAGAGACGACTTCGTTGAAGGTTTGTCTTTCGCTAGATCTGGTGGT 1380
 -----+-----+-----+-----+-----+-----+
 AACCCATCTACATTCTCTCTGCTGAAGCAACTTCCAAACAGAAAGCGATCTAGACCACCA

L G R C K R D D F V E G L S F A R S G G -

1381 AACTGGGCTGAATGTTTCGCTTAA 1404
 -----+-----+-----+-----+
 TTGACCCGACTTACAAAGCGAATT

N W A E C F A *

Fig. 23c

0948866-01200

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

51/56

1 ATGGGCGTGTTCGTGCTGCTACTGTCCATTGCCACCTTGTTTCGGTTCCACATCCGGTACC
 -----+-----+-----+-----+-----+ 60
 TACCCGCACAAGCAGCAGCATGACAGGTAACGGTGGAACAAGCAAGGTGTAGGCCATGG

 M G V F V V L L S I A T L F G S T S G T -

 61 GCCTTGGGTCCTCGTGGTAATTCTCACTCTTGTGACACTGTTGACGGTGGTTACCAATGT
 -----+-----+-----+-----+-----+ 120
 CGGAACCCAGGAGCACCATTAAAGAGTGAGAACTGTGACAACCTGCCACCAATGGTTACA

 A L G P R G N S H S C D T V D G G Y Q C -

 121 TTCCAGAAATTTCTCACTTGTGGGGTACATACTCTCCATTCTTCTCTTTGGCTGACGAA
 -----+-----+-----+-----+-----+ 180
 AAGGGTCTTTAAAGAGTGAACACCCCATGTATGAGAGGTAAGAAGAGAAACCGACTGCTT

 F P E I S H L W G T Y S P F F S L A D E -

 181 TCTGCTATTTCTCCAGACGTTCCAAAGGGTTGTAGAGTTACTTTTCGTTCAAGTTTTGTCT
 -----+-----+-----+-----+-----+ 240
 AGACGATAAAGAGGTCTGCAAGGTTTCCCAACATCTCAATGAAAGCAAGTTCAAACAGA

 S A I S P D V P K G C R V T F V Q V L S -

 241 AGACACGGTGCTAGATACCCAACCTTCTTCTAAGTCTAAGGCTTACTCTGCTTTGATTGAA
 -----+-----+-----+-----+-----+ 300
 TCTGTGCCACGATCTATGGGTTGAAGAAGATTCAAGTCCGAATGAGACGAACTAAGT

 R H G A R Y P T S S K S K A Y S A L I E -

 301 GCTATTCAAAGAACGCTACTGCTTTCAAGGGTAAGTACGCTTTCTTGAAGACTTACAAT
 -----+-----+-----+-----+-----+ 360
 CGATAAGTTTTCTTGCATGACGAAAGTTCCCATTCATGCGAAAGAACTTCTGAATGTTA

 A I Q K N A T A F K G K Y A F L K T Y N -

 361 TACACTTTGGGTGCTGACGACTTGACTCCATTCCGGTGAACAACAAATGGTTAACTCTGGT
 -----+-----+-----+-----+-----+ 420
 ATGTGAAACCCACGACTGCTGAACTGAGGTAAGCCACTTGTTGTTTACCAATTGAGACCA

 Y T L G A D D L T P F G E Q Q M V N S G -

 421 ATTAAGTTCTACAGAAGATACAAGGCTTTGGCTAGAAAGATTGTTCCATTCATTAGAGCT
 -----+-----+-----+-----+-----+ 480
 TAATTCAAGATGTCTTCTATGTTCCGAAACCGATCTTCTAACAAGGTAAGTAATCTCGA

 I K F Y R R Y K A L A R K I V P F I R A -

 481 TCTGGTTCTGACAGAGTTATTGCTTCTGCCGAAAAGTTCATTGAAGGTTTCCAATCTGCT
 -----+-----+-----+-----+-----+ 540
 AGACCAAGACTGTCTCAATAACGAAGACGGCTTTTCAAGTAACTTCAAAGGTTAGACGA

 S G S D R V I A S A E K F I E G F Q S A -

Fig. 24a

0948365-012000

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

52/56

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AAGTTGGCTGACCCAGGTGCTAACCCACACCAAGCTTCTCCAGTTATTAACGTTATTATT
541 -----+-----+-----+-----+-----+-----+ 600
TTCAACCGACTGGGTCCACGATTGGGTGTGGTTTCAAGAGGTCAATAATTGCAATAATAA

K L A D P G A N P H Q A S P V I N V I I -

CCAGAAGGTGCTGGTTACAACAACACTTTGGACCACGGTTTGTGTACTGCTTTTCAAGAA
601 -----+-----+-----+-----+-----+-----+ 660
GGTCTTCCACGACCAATGTTGTTGTGAAACCTGGTGCCAAACACATGACGAAAGCTTCTT

P E G A G Y N N T L D H G L C T A F E E -

TCTACCCTAGGTGACGACGTTGAAGCTAACTTCACTGCTGTTTTCTGCTCCACCAATTAGA
661 -----+-----+-----+-----+-----+-----+ 720
AGATGGGATCCACTGCTGCAACTTCGATTGAAGTGACGACAAAAGCGAGGTGGTTAATCT

S T L G D D V E A N F T A V F A P P I R -

GCTAGATTGGAAGCTCACTTGCCAGGTGTTAACTTGACTGACGAAGACGTTGTTAACTTG
721 -----+-----+-----+-----+-----+-----+ 780
CGATCTAACCTTCGAGTGAACGGTCCACAATTGAACTGACTGCTTCTGCAACAATTGAAC

A R L E A H L P G V N L T D E D V V N L -

ATGGACATGTGTCCATTCGACACTGTTGCTAGAACTTCTGACGCTACTCAATTGTCTCCA
781 -----+-----+-----+-----+-----+-----+ 840
TACCTGTACACAGGTAAGCTGTGACAACGATCTTGAAGACTGCGATGAGTTAACAGAGGT

M D M C P F D T V A R T S D A T Q L S P -

TTCTGTGACTTGTTCACTCACGACGAATGGATTCAATACGACTACTTGCAATCTTTGGGT
841 -----+-----+-----+-----+-----+-----+ 900
AAGACACTGAACAAGTGAGTGCTGCTTACCTAAGTTATGCTGATGAACGTTAGAAACCCA

F C D L F T H D E W I Q Y D Y L Q S L G -

AAGTACTACGGTTACGGTGCTGGTAACCCATTGGGTCCAGCTCAAGGTGTTGGTTTCGTT
901 -----+-----+-----+-----+-----+-----+ 960
TTCATGATGCCAATGCCACGACCATTGGGTAACCCAGGTGAGTTCCACAACCAAAGCAA

K Y Y G Y G A G N P L G P A Q G V G F V -

AACGAATTGATTGCTAGATTGACTCACTCTCCAGTTCAAGACCACACTTCTACTAACCAC
961 -----+-----+-----+-----+-----+-----+ 1020
TTGCTTAACCTAACGATCTAACTGAGTGAGAGGTCAAGTTCTGGTGTGAAGATGATTGGTG

N E L I A R L T H S P V Q D H T S T N H -

ACTTTGGACTCTAACCCAGCTACTTTCCCATTTGAACGCTACTTTGTACGCTGACTTCTCT
1021 -----+-----+-----+-----+-----+-----+ 1080
TGAAACCTGAGATTGGGTGCGATGAAAGGGTAACTTGCGATGAAACATGCGACTGAAGAGA

T L D S N P A T F P L N A T L Y A D F S -

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Fig. 24b

000210"59283460

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

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1081 CACGACAACACTATGGTTTCTATTTTCTTCGCTTTGGGTTTGTACAACGGTACTAAGCCA
-----+-----+-----+-----+-----+ 1140
GTGCTGTTGTGATACCAAAGATAAAAGAAGCGAAACCCAAACATGTTGCCATGATTCCGGT

H D N T M V S I F F A L G L Y N G T K P -

1141 TTGTCTACTACTTCTGTTGAATCTATTGAAGAACTGACGGTTACTCTGCTTCTTGGACT
-----+-----+-----+-----+-----+ 1200
AACAGATGATGAAGACAACTTAGATAACTTCTTTGACTGCCAATGAGACGAAGAACCTGA

L S T T S V E S I E E T D G Y S A S W T -

1201 GTTCCATTGCTGCTAGAGCTTACGTTGAAATGATGCAATGTGAAGCTGAAAAGGAACCA
-----+-----+-----+-----+-----+ 1260
CAAGGTAAGCGACGATCTCGAATGCAACTTTACTACGTTACACTTCGACTTTTCCTTGGT

V P F A A R A Y V E M M Q C E A E K E P -

1261 TTGGTTAGAGTTTGGTTAACGACAGAGTTGTTCCATTGCACGGTTGTGCTGTTGACAAG
-----+-----+-----+-----+-----+ 1320
AACCAATCTCAAAACCAATTGCTGTCTCAACAAGGTAAAGTGCCAACACGACAACTGTTC

L V R V L V N D R V V P L H G C A V D K -

1321 TTGGGTAGATGTAAGAGAGACGACTTCGTTGAAGGTTTGTCTTTCGCTAGATCTGGTGGT
-----+-----+-----+-----+-----+ 1380
AACCCATCTACATTCTCTCTGCTGAAGCAACTTCCAAACAGAAAGCGATCTAGACCACCA

L G R C K R D D F V E G L S F A R S G G -

1381 AACTGGGAAGAATGTTTCGCTTAA
-----+-----+----- 1404
TTGACCCTTCTTACAAAGCGAATT

N W E E C F A *

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Fig. 24c

09483255-012000

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

54/56

ATGGGCGTGTTCGTGCTACTGTCCATTGCCACCTTGTTTCGGTTCACATCCGGTACC
 1 -----+-----+-----+-----+-----+ 60
 TACCCGCACAAGCAGCAGCATGACAGGTAACGGTGAACAAGCCAAGGTGTAGGCCATGG
 M G V F V V L L S I A T L F G S T S G T -
 GCCTTGGGTCCTCGTGGTAATTCTCACTCTTGTGACACTGTTGACGGTGGTTACCAATGT
 61 -----+-----+-----+-----+-----+ 120
 CGGAACCCAGGAGCACCATTAAAGAGTGAGAACACTGTGACAACCTGCCACCAATGGTTACA
 A L G P R G N S H S C D T V D G G Y Q C -
 TTCCAGAAATTTCTCACTTGTGGGGTACATACTCTCCATTCTTCTCTTTGGCTGACGAA
 121 -----+-----+-----+-----+-----+ 180
 AAGGGTCTTTAAAGAGTGAACACCCCATGTATGAGAGGTAAGAAGAGAAACCGACTGCTT
 F P E I S H L W G T Y S P F F S L A D E -
 TCTGCTATTTCTCCAGACGTTCCAAAGGGTGTAGAGTTACTTTTCGTTCAAGTTTTGTCT
 181 -----+-----+-----+-----+-----+ 240
 AGACGATAAAGAGGTCTGCAAGGTTTCCCAACATCTCAATGAAAGCAAGTTCAAAACAGA
 S A I S P D V P K G C R V T F V Q V L S -
 AGACACGGTGCTAGATACCCAACCTTCTTCTGCGTCTAAGGCTTACTCTGCTTTGATTGAA
 241 -----+-----+-----+-----+-----+ 300
 TCTGTGCCACGATCTATGGGTTGAAGAAGACGCAGATTCCGAATGAGACGAACTAACTT
 R H G A R Y P T S S A S K A Y S A L I E -
 GCTATTCAAAGAACGCTACTGCTTTCAAGGGTAAGTACGCTTTCTTGAAGACTTACAAT
 301 -----+-----+-----+-----+-----+ 360
 CGATAAGTTTTCTTGCATGACGAAAGTTCCCATTCATGCGAAAGAACTTCTGAATGTTA
 A I Q K N A T A F K G K Y A F L K T Y N -
 TACACTTTGGGTGCTGACGACTTGACTCCATTTCGGTGAACAACAAATGGTTAACTCTGGT
 361 -----+-----+-----+-----+-----+ 420
 ATGTGAAACCCACGACTGCTGAACTGAGGTAAGCCACTTGTGTTTACCAATTGAGACCA
 Y T L G A D D L T P F G E Q Q M V N S G -
 ATTAAGTTCTACAGAAGATACAAGGCTTTGGCTAGAAAGATTGTTCCATTTCATTAGAGCT
 421 -----+-----+-----+-----+-----+ 480
 TAATTCAAGATGTCTTCTATGTTCCGAAACCGATCTTTCTAACAAGGTAAGTAATCTCGA
 I K F Y R R Y K A L A R K I V P F I R A -
 TCTGGTTCTGACAGAGTTATTGCTTCTGCCGAAAAGTTCATTGAAGGTTTCCAATCTGCT
 481 -----+-----+-----+-----+-----+ 540
 AGACCAAGACTGTCTCAATAACGAAGACGGCTTTTCAAGTAACTTCCAAAGGTTAGACGA
 S G S D R V I A S A E K F I E G F Q S A -

Fig. 25a

000210"5928460

APPROVED	D.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

55/56

541 AAGTTGGCTGACCCAGGTGCTAACCCACACCAAGCTTCTCCAGTTATTAACGTTATTATT
 -----+-----+-----+-----+-----+ 600
 TTCAACCGACTGGGTCCACGATTGGGTGTGGTTCGAAGAGGTCAATAATTGCAATAATAA

 K L A D P G A N P H Q A S P V I N V I I -

 601 CCAGAAGGTGCTGGTTACAACAACACTTTGGACCACGGTTTGTGTACTGCTTTTGAAGAA
 -----+-----+-----+-----+-----+ 660
 GGTCTTCCACGACCAATGTTGTTGTGAAACCTGGTGCCAAACACATGACGAAAGCTTCTT

 P E G A G Y N N T L D H G L C T A F E E -

 661 TCTACCCTAGGTGACGACGTTGAAGCTAACTTCACTGCTGTTTTCTGCTCCACCAATTAGA
 -----+-----+-----+-----+-----+ 720
 AGATGGGATCCACTGCTGCAACTTCGATTGAAGTGACGACAAAAGCGAGGTGGTTAATCT

 S T L G D D V E A N F T A V F A P P I R -

 721 GCTAGATTGGAAGCTCACTTGCCAGGTGTTAACTTGACTGACGAAGACGTTGTTAACTTG
 -----+-----+-----+-----+-----+ 780
 CGATCTAACCTTCGAGTGAACGGTCCACAATTGAACTGACTGCTTCTGCAACAATTGAAC

 A R L E A H L P G V N L T D E D V V N L -

 781 ATGGACATGTGTCCATTCGACACTGTTGCTAGAACTTCTGACGCTACTCAATTGTCTCCA
 -----+-----+-----+-----+-----+ 840
 TACCTGTACACAGGTAAGCTGTGACAACGATCTTGAAGACTGCGATGAGTTAACAGAGGT

 M D M C P F D T V A R T S D A T Q L S P -

 841 TTCTGTGACTTGTTCACTCACGACGAATGGATTCAATACGACTACTTGCAATCTTTGGGT
 -----+-----+-----+-----+-----+ 900
 AAGACACTGAACAAGTGAGTGCTGCTTACCTAAGTTATGCTGATGAACGTTAGAAACCCA

 F C D L F T H D E W I Q Y D Y L Q S L G -

 901 AAGTACTACGGTTACGGTGCTGGTAACCCATTGGGTCCAGCTCAAGGTGTTGGTTTCGTT
 -----+-----+-----+-----+-----+ 960
 TTCATGATGCCAATGCCACGACCATTTGGGTAAACCCAGGTCGAGTTCACAACCAAGCAA

 K Y Y G Y G A G N P L G P A Q G V G F V -

 961 AACGAATTGATTGCTAGATTGACTCACTCTCCAGTTCAAGACCACACTTCTACTAACCAC
 -----+-----+-----+-----+-----+ 1020
 TTGCTTAACTAACGATCTAAGTGAGTGAAGGTCAAGTTCTGGTGTGAAGATGATTGGTG

 N E L I A R L T H S P V Q D H T S T N H -

 1021 ACTTTGGACTCTAACCCAGCTACTTTCCATTGAACGCTACTTTGTACGCTGACTTCTCT
 -----+-----+-----+-----+-----+ 1080
 TGAAACCTGAGATTGGGTGATGAAAGGGTAAGTTGCGATGAAACATGCGACTGAAGAGA

 T L D S N P A T F P L N A T L Y A D F S -

Fig. 25b

09488265-012000

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

56/56

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1081 CACGACAACACTATGGTTTCTATTTTCTTCGCTTTGGGTTTGTACAACGGTACTAAGCCA
-----+-----+-----+-----+-----+ 1140
GTGCTGTTGTGATACCAAAGATAAAAGAAGCGAAACCCAAACATGTTGCCATGATTCCGGT

H D N T M V S I F F A L G L Y N G T K P -

1141 TTGTCTACTACTTCTGTTGAATCTATTGAAGAACTGACGGTTACTCTGCTTCTTGACT
-----+-----+-----+-----+-----+ 1200
AACAGATGATGAAGACAACTTAGATAACTTCTTTGACTGCCAATGAGACGAAGAACCTGA

L S T T S V E S I E E T D G Y S A S W T -

1201 GTTCCATTTCGCTGCTAGAGCTTACGTTGAAATGATGCAATGTGAAGCTGAAAAGGAACCA
-----+-----+-----+-----+-----+ 1260
CAAGGTAAGCGACGATCTCGAATGCAACTTTACTACGTTACACTTCGACTTTTCCTTGGT

V P F A A R A Y V E M M Q C E A E K E P -

1261 TTGGTTAGAGTTTGGTTAACGACAGAGTTGTTCCATTGCACGGTTGTGCTGTTGACAAG
-----+-----+-----+-----+-----+ 1320
AACCAATCTCAAAACCAATTGCTGTCTCAACAAGGTAACGTGCCAACACGACAACCTGTTT

L V R V L V N D R V V P L H G C A V D K -

1321 TTGGGTAGATGTAAGAGAGACGACTTCGTTGAAGGTTTGTCTTTTCGCTAGATCTGGTGGT
-----+-----+-----+-----+-----+ 1380
AACCCATCTACATTCTCTCTGCTGAAGCAACTTCCAAACAGAAAGCGATCTAGACCACCA

L G R C K R D D F V E G L S F A R S G G -

1381 AACTGGGAAGAATGTTTCGCTTAA
-----+-----+----- 1404
TTGACCCTTCTTACAAAGCGAATT

N W E E C F A *
```

Fig. 25c

000210" 59233450